

Assessment of the Public Works Department
SPRINGFIELD, MASSACHUSETTS



June 3, 2005

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1. INTRODUCTION AND EXECUTIVE SUMMARY

1. INTRODUCTION AND EXECUTIVE SUMMARY

The report, which follows, presents the results of the performance audit of the Public Works Department conducted by the Matrix Consulting Group for the Springfield Financial Control Board. This was the first phase of a three-phase study approach. In the first phase of the study, the project team conducted a performance audit of the current service delivery functions and service components of the Department of Public Works based upon organizational structure, cost, workload, staffing, equipment, demand, frequency, performance and such other factors as deemed appropriate, to identify opportunities to reduce costs, improve productivity, and enhance effectiveness.

This first chapter introduces the analysis - outlining principal objectives and how the analysis was conducted - and presents an Executive Summary.

1. AUDIT SCOPE AND OBJECTIVES

As stated in the Request for Proposal, the services sought in this first phase of the assessment included the evaluation of the current service delivery functions and service components of the Public Works Department based upon organizational structure, cost, workload, staffing, equipment, demand, frequency, performance and such other factors as deemed appropriate, and the comparison of the service delivery functions and methods in the Public Works Department with similar services provided by at least three other benchmark communities.

The approach of the project team in meeting this scope is portrayed below.

- **Develop an in-depth understanding of the key issues impacting the Public Works Department.** To evaluate the Public Works Department, Matrix Consulting Group conducted interviews with Public Works Department staff. Interviews focused on goals and objectives, management systems, the use of

technology, the levels of service provided by the department, the resources available to provide those services, etc.

- **Develop a Profile of the Public Works Department.** The Matrix Consulting Group conducted interviews with departmental staff and other key staff in the City of Springfield to document current organization of services, the structure and functions of the department, budgets, workload data, management systems, inventory of the infrastructure, etc.
- **Conduct a comparison of the Public Works Department program and practices to ‘best management practices.’** The ‘best management practices’ included comparisons to the American Public Works Association *Public Works Management Practices Manual*, standards developed by the American Water Works Association such as *G200: Distribution Systems Operations and Management*, and the experience of the project team. The project team also conducted a comparative survey of Public Works Departments in other cities to compare the Public Works Department’s programs and practices to these other cities.
- **Evaluate the staffing, organization structure, and service levels in the Public Works Department.** This included interviews with key staff to develop an understanding of the current service delivery model, evaluation of the adequacy of current service levels, work practices, work planning and scheduling systems, productivity and staffing levels, the plan of organization, and asset management.

The objective of this assessment was to identify opportunities for improvement in the operational and economic efficiency of the department and practicable opportunities for enhancing the quality of its product and services.

2. PROJECT METHODOLOGIES

The processes utilized in developing this study are described in the points below:

- The project team conducted preliminary data collection for the assessment to ensure a clear understanding by the Public Works Department of the scope of the project, obtained the views and perspectives of top management, and obtained an initial understanding of the Public Works Department including mission, goals, objectives, business processes, service level targets, performance indicators, and initial issues and opportunities for improvement.
- The project team conducted interviews with top, middle management, and first line supervisors in the Public Works Department. The purpose of these interviews was to develop a detailed understanding of the Public Works

Department including how services are delivered, staffed, managed, and the costs associated with the delivery of those services.

- The project team collected data regarding service delivery by the Public Works Department including organization of services, the structure and functions of the department, budgets, workload data, management systems, inventory of the infrastructure, etc..
- The project team compared the practices and programs of the Public Works Department to the American Public Works Association *Public Works Management Practices Manual*, standards developed by the American Water Works Association such as *G200: Distribution Systems Operations and Management*, and the experience of the project team. The project team also conducted a comparative survey of Public Works Departments in other cities to compare the Public Works Department's programs and practices to these other cities.

The following section provides a discussion of the structure of the report.

3. ACCOMPLISHMENTS OF THE PUBLIC WORKS DEPARTMENT

Since assessments focus much of their time and effort identifying opportunities for improvement, it is important to recognize that numerous functions and activities at the Public Works Department are working well. For example, some of the noteworthy accomplishments of the Public Works Department include:

- The Solid Waste Division collects 35% of the residential refuse collection using automated collection equipment. The Division uses one-person crews for residential refuse collection.
- The department effectively utilizes geographic information systems, weather radar, and inspectors to manage snow plowing operations, to provide a graphical view of what areas have not yet had snow plowed, and allow for the shifting of resources to assist in those areas, and to anticipate the intensity and timing of any storm event.
- The department provides high levels of service in a number of divisions. For example, the Garage Division operates a day shift and swing shift, and the Solid Waste Division collects bulk waste weekly and yard waste on a two-week cycle.
- The department has recently installed a fleet management information system (VHB Equipment Manager 2000) for the Garage Division, and uses an automated fuel dispensing information system (Petro Vend).

- The department has converted mechanical parking meters to electronic parking meters providing for easier rate changes, electronic audit capabilities, and increased revenue security and dependability.
- The department has recently hired an Executive Director for the Thomas J. O'Connor Animal Control Center to enhance the professionalism of the management of that facility and its services.

The assessment identified other numerous accomplishments that reflect well of the management, supervisors, and staff of the Public Works Department.

4. FIVE-POINT AGENDA FOR CHANGE

The assessment of the Public Works Department identified over 100 recommendations for improvement that the Matrix Consulting Group believes should provide the basis for change in the Public Works Department in the coming years.

These recommendations fall into 5 major improvement areas including:

- Management systems;
- Administrative and management structure;
- Preventive maintenance of the infrastructure;
- Delivery of core services; and
- Cost effective service delivery.

Each of these major points in the improvement agenda are briefly summarized below.

(1) Management Systems

The driving force behind any high performing organization is clear direction and the management systems that communicate and translate policy into action. The Public Works Department has made initial efforts to provide that direction and the management systems such as the VHB Equipment Manager 2000. Overall, however, managers and supervisors have little information with which make key service delivery

and budgetary decisions. The Public Works Department faces a number of challenges to use its resources more efficiently and effectively, and more importantly, to redirect resources and invest in maintenance and preservation of the City's infrastructure. The department is limited in its ability to address these challenges as a result of the lack of management systems. The management of the Public Works Department needs to enhance the management systems within the department through such tools as:

- Full implementation of the VHB Equipment Manager 2000 system;
- Development of a maintenance management system for City's infrastructure including acquisition and installation of computerized maintenance management system; and
- Development of comprehensive goals, objectives, performance measures and reporting systems.

The Public Works Department should employ these management systems to make the department a place where performance centered around goals serves to drive its operations.

(2) Administrative and Management Structure

The management of the Public Works Department is charged with ensuring the efficient and effective deliver of infrastructure preservation and maintenance services to the residents of Springfield. There is an opportunity to streamline the reporting structure of the department. The Matrix Consulting Group is recommending that the Public Works Department adopt a new organizational structure. The major changes in the plan of organization include the elimination of a layer of management, the strengthening of the management and supervision of the Engineering Division, and the reallocation of the Thomas J. O'Connor Animal Control Center to the Health and Human Services Department.

The purpose of the streamlining of the administrative and management organization is to reduce the administrative overhead and place each division within the department at a level in accordance with its importance with achieving departmental goals.

(3) Preventive Maintenance of the Infrastructure

Springfield taxpayers have a significant investment in streets, sidewalks, traffic signals, signs, water distribution systems, sewer collection systems, and stormwater collection systems. Preserving these assets prolongs their useful life and reduces the long-term maintenance and rehabilitation costs. This is the primary objective of preventive maintenance.

The Public Works Department is not preventively maintaining this infrastructure on a routine ongoing basis. The Public Works Department needs to pursue a coordinated and comprehensive effort to ensure the efficient and effective preventive maintenance of those assets assigned to the department. This includes such efforts as:

- Preparation of an infrastructure master plan that provides long-term direction for the maintenance, repair, and rehabilitation of the City's assets;
- The department should develop and install strategies for the preventive maintenance of the City's street system including acquisition of the American Public Works Association's MicroPAVER as its pavement management software, evaluation of the pavement condition of the City's streets on a three year cycle with one-third of the streets evaluated each year, expansion of the non-structural overlays, and allocating the staff of the Streets Division primarily to pothole patching, base repair, skin patching, and crack sealing;
- The department should develop and install strategies for the preventive maintenance of the City's traffic signals including cabinet maintenance and traffic signal inspection;
- The department should develop and install strategies for the preventive maintenance system for water distribution systems including system flushing, valve exercising, fire hydrant maintenance, etc.;

- The department should develop and install strategies for the preventive maintenance of the sewer collection system including sewer main cleaning, CCTV inspection of sewer mains, siphon cleaning, etc.; and
- The department should develop and install strategies for the preventive maintenance of stormwater collection system including cleaning of catch basins.

Preventive maintenance improves an asset's operating efficiency, prevents premature replacement, and avoids interruptions in service for residents. Preventive maintenance reduces long-term costs by maximizing the operating capacities of an asset, minimizing downtime, and avoiding breakdowns that would otherwise lead to higher repair costs later.

The effective preventive maintenance of these assets must be an essential goal of the Public Works Department – one that is utilized to judge the effectiveness of the department's management.

(4) Delivery of Core Services

A central question facing the management of the Public Works Department is what services the department should and should not provide: what are the priorities in the department for services given the funding limitation and challenges that face the City. Cost effective service delivery requires that the management of the Public Works Department concentrate their limited financial resources on their core services. In determining what constitutes a core service, the managers of the department need to ask questions such as:

- Is this service advancing me towards one of my desired outcomes?
- If we were to design this department from scratch, would we be providing this service?
- If not, should we even be providing this service at all?

The Public Works Department is engaged in businesses that do not advance the department towards its desired outcome. These include towing and storage of vehicles, the Thomas J. O'Connor Animal Control Center, the installation and replacement of water and sewer mains, the provision of "Mad Vac" sweeping services for the downtown, the collection of solid waste for condominiums, apartments, and businesses, cleaning out blockages of private sewer connections and replacing private sewer connections, etc.

In order to adequately focus on the Public Works Department core businesses, the department should get out of these ancillary or non-core businesses activities that detract and hinder the department in achieving its goals such as preventive maintenance of assets

At the same time, the department has privatized services that are recommended for insourcing. These include pavement legend painting and crack sealing.

(5) Cost Effective Service Delivery

The Public Works Department faces a number of challenges including fiscal limitations and decaying infrastructure. The effective response of the department to these challenges requires that the department transform the way it does its business by injecting competition into service delivery, using activity-based costing to identify how much it costs to deliver services, installing accountability systems for managers and supervisors, and reengineering work processes.

A number of services that are currently delivered by the Public Works Department should be opened up for competition from the private sector. These initially include solid waste collection, street sweeping, and storage of towed vehicles.

The Public Works Department should reduce its costs and increase its productivity, performance, and service levels by redesigning and reengineering the way services are delivered. This includes a multitude of steps including such examples as the following:

- Reducing the value of the inventory in the Stores and increasing the number of inventory turns annually;
- Reduction of crew sizes in traffic signal maintenance and repair, sign installation and replacement, water distribution system maintenance and repair, yard waste collection, pothole patching, etc.;
- Reengineering work processes such as utility cut patching, expanded use of automated solid waste collection, etc.;
- Enhancing the effective use of its staff by reallocating the three positions assigned to the “yard” at 70 Tapley Street to street maintenance, reducing the number of hours sewer collection system staff spend in the “yard” etc.;
- Eliminating underutilized City vehicles;
- Increasing the revenue collected by the department for the services it provides by charging fees for plan checking of development plans, increasing fees for bulk waste collection, joining the many cities in Massachusetts that have instituted Pay As You Throw programs, levying and collecting fines for abandoned vehicles, accepting private roads to increase Chapter 90 revenue, etc.; and
- Reducing staffing levels to fit the workload.

The Public Works Department should take steps to assure that it fully recovers its costs for services it delivers on behalf of the Water and Sewer Commission such as fringe benefits and workers compensation, and that the Commission reimburses the department for Stores inventory purchased on behalf of the Commission. The Public Works Department should renegotiate the agreement with the Commission to clarify roles and responsibilities in the maintenance and repair of the water distribution system and the sewer collection system and the delivery of engineering services in support of

these two systems.

* * * * *

There are a number of obstacles faced by the Public Works Department in the delivery of cost effective services that the department requires assistance of other departments. These include the following:

- Replacement of the legacy finance and human resource information system – known as Mapper – to enable the Public Works Department to reengineer its business systems;
- Acquisition of an automated permit information system to enable the enhancement of customer service;
- Reengineering and simplifying the process for filling vacant positions;
- Improving the management of the City's worker's compensation return-to-work program; and
- Establishing the Garage Division as an internal service fund.

5. EXECUTIVE SUMMARY

The Matrix Consulting Group has prepared this summary of the recommendations contained in the attached report. This summary is presented in the table below.

| Chapter 2 – Management and Administrative Systems | | | | |
|--|--|--|---------------------------------|--|
| Index | Recommendation | Responsibility for Implementation | Timeframe for Completion | Cost Increase/(Savings) |
| 2.2 | The Public Works should install a maintenance management system for Highways, Traffic, and Water and Sewer Divisions | Public Works Director | July-September 2005 | \$140,850 one-time \$35,000 ongoing |

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|---|--|--|---------------------------------|---|
| 2.3 | The Public Works Department should enhance its goals, objectives, and performance measures, and develop performance reporting systems | Public Works Director | October-December 2005 | N/A |
| 2.4 | The Public Works Department should develop an information technology strategic plan | Public Works Director | March-June 2006 | N/A |
| 2.5 | The Public Works Department should develop written policies and procedures to guide managers and supervisors | Public Works Director | October-December 2006 | N/A |
| 2.6 | The Public Works Department should enhance its employee safety program | Public Works Director | July-September 2005 | N/A |
| 2.7 | The Personnel Department should enhance the employee selection process and the return-to-work program | Personnel Director | October-December 2005 | (\$88,000) |
| 2.8 | The process for filling a vacant position should be reengineered | Personnel Director | October-December 2005 | N/A |
| 2.9 | The City should replace its legacy financial and human resource system | Finance Director | October-December 2006 | \$400,000 one-time \$100,000 ongoing |
| Chapter 3 – Plan of Organization | | | | |
| 3.1 | The plan of organization of the Public Works Department should be modified. | Public Works Director | July-September 2005 | (\$500,000) |
| Chapter 4 – Administration | | | | |
| 4.1 | The Senior Comptroller in the Public Works Department should reconcile the inventory audits in the future within thirty calendar days of the completion of the audit | Senior Comptroller | July-September 2006 | N/A |

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|--------------|---|--|---------------------------------|--------------------------------|
| 4.1 | The Stores Section should conduct weekly spot audits of the materials and supplies on hand weekly and reconcile the results to the legacy finance and human resource information system | Senior Comptroller | July-September 2005 | N/A |
| 4.1 | The Stores Section needs to provide security for materials and supplies. | Senior Comptroller | July-September 2005 | \$35,000 One-Time |
| 4.1 | The value of the inventory in the Stores should be reduced from its current value of \$850,000 to \$170,000 to \$210,000 | Senior Comptroller | July-September 2005 | (\$19,200) |
| 4.1 | The Stores Section should set and meet an objective of five to six inventory turns annually | Senior Comptroller | July-September 2005 | N/A |
| 4.1 | The Skilled Laborer position assigned to “chasing” parts for the Garage should be eliminated | Public Works Director | July-September 2005 | (\$52,000) |
| 4.1 | The Senior Storekeeper and Storekeeper positions assigned to the support of the Garage Division should be placed under the supervision of the Assistant Deputy Director – Garage Division. | Public Works Director | July-September 2005 | N/A |
| 4.1 | The Water and Sewer Commission should reimburse the City for the \$340,000 in materials and supplies maintained in the Stores for the water and sewer utilities. | Finance Director | July-September 2005 | (\$340,000) One-Time |
| 4.1 | The Stores should not be funded as a working capital fund, but should charge the divisions and the Water and Sewer Commission for any materials and supplies it purchases for these customers | Finance Director | July-September 2005 | N/A |

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| 4.1 | Four positions assigned to the Stores Section, two of which are vacant at the present time, should be eliminated. These four positions include a Storekeeper, Senior Storekeeper, a Skilled Laborer, and Laborer | Public Works Director | July-September 2005 | (\$208,000) |
| 4.2 | The Public Works Department should enhance enforcement efforts to detect illegal dumping and apprehend violators | Public Works Director | July-September 2005 | N/A |
| 4.2 | The Public Works Department should work with Community Development-Housing to identify those abandoned houses that are frequent targets of illegal dumping and develop a plan using Community Development Block Grant funds to demolish these abandoned houses | Public Works Director | July-September 2005 | N/A |
| 4.2 | The level of staffing for the Clean Cities Section should be reduced by two positions | Public Works Director | July-September 2005 | (\$104,000) |
| 4.2 | The manager for the Code Enforcement Department should meet with the Working Foremen Skilled Laborer for the Clean Cities Section on a monthly basis to discuss the status of the liens, the amount of money collected, court orders that will be issued in the near term, etc. | Public Works Director | April-June 2005 | N/A |
| 4.3 | The Contracts Administrator position should be reallocated to the Purchasing Division | Public Works Director | July-September 2005 | N/A |
| 4.4 | Two vacant positions in Administration should be eliminated | Public Works Director | July-September 2005 | (\$104,000) |

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| 4.5 | The number of staff authorized for the Customer Service Center should be reduced by two positions, and sundry labor should be authorized for peak workload | Public Works Director | July-September 2005 | (\$55,000) |
| Chapter 5 – Animal Control | | | | |
| 5.1 | The City should exercise the option to purchase the Thomas J. O'Connor Animal Control Center. | Finance Director | October-December 2005 | (\$1,100,000) assuming a 4% interest rate environment |
| 5.1 | If the negotiations to purchase this facility should provide difficult to conclude, the City should explore abandoning the facility and contracting with a non-profit to provide animal shelter services. | Finance Director | October-December 2005 | N/A |
| 5.2 | The Thomas J. O'Connor Animal Control Center should conduct a daily inventory of animals in the Center at the start of the day and at the end of the day in accordance with HSUS guidelines. | Executive Director, Thomas J. O'Connor Animal Control Center | July-September 2005 | N/A |
| 5.3 | The staffing plan for the Thomas J. O'Connor Animal Control Center should be adjusted. | Public Works Director | July-September 2005 | N/A |
| 5.4 | The hours that the Thomas J. O'Connor Animal Control Center should be expanded to seven hours a day including being open until 5:30 PM. | Public Works Director | July-September 2005 | N/A |
| 5.5 | The Thomas J. O'Connor Animal Control Center should acquire Chameleon animal shelter software. | Public Works Director | July-September 2005 | \$11,800 One-Time \$3,000 Ongoing |
| 5.6 | The contract with the existing veterinarian should be terminated immediately and a Request for Proposal issued for a veterinarian to provide services to the Center. | Executive Director, Thomas J. O'Connor Animal Control Center | July-September 2005 | N/A |

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| 5.7 | The City of Springfield should require all veterinarians in Springfield to provide the Thomas J. O'Connor Animal Control Center with a copy of the rabies certification form. | Executive Director, Thomas J. O'Connor Animal Control Center | April-June 2005 | N/A |
| 5.8 | The Animal Control Center should spay or neuter dogs and cats adopted from the Center by providing these services at the Center through a contract veterinarian | Executive Director, Thomas J. O'Connor Animal Control Center | April-June 2005 | \$4,200 One-Time |
| Chapter 6 – Engineering and Traffic | | | | |
| 6.1 | The City should prepare and the City Council should adopt a five-year capital improvement program. | Finance Director | July 2006 | N/A |
| 6.2 | The Public Works Department should prepare an infrastructure master plan. | Public Works Director | July 2006 | N/A |
| 6.3 | The Public Works Department should acquire the American Public Works Association's MicroPAVER as its pavement management software. | City Engineer | July-September 2005 | \$2,000 One-Time |
| 6.3 | The City should evaluate the pavement condition of its streets on a three-year cycle, with 33% of the streets being evaluated each year | City Engineer | October- December 2005 | N/A |
| 6.3 | The Engineering and Traffic Division should develop funding strategies for preventive/corrective maintenance requirements of the City's streets. | City Engineer | October- December 2005 | N/A |
| 6.3 | The Public Works Department should expand the non-structural overlays utilized for preventive maintenance of the City's streets beyond overlay to include slurry seal and micro-surfacing | City Engineer | October- December 2005 | TBD based upon pavement condition evaluation |

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| 6.4 | The Public Works Department should improve the management of the capital improvement program | City Engineer | October-December 2005 | N/A |
| 6.5 | The Engineering Division should conduct an evaluation of private roads to assess their condition. The City should accept those private roads that are in fair to very good condition and that meet the width requirements of the zoning ordinance. | City Engineer | July-September 2006 | \$275,000 in additional annual Chapter 90 revenue |
| 6.6 | The Public Works Department should charge fees for the plan checking of definitive subdivision review, a site plan review, minor modifications, and other types of development review applications | City Engineer | July - September 2005 | \$50,000 in additional annual revenue |
| 6.7 | The Planning Department should assume responsibility as the lead department in the review and conditional approval of zoning and subdivision permits. | Planning Director | July-September 2005 | N/A |
| 6.8 | The City Engineer should develop application guides for preliminary subdivision review, definitive subdivision review, site plan review, minor modifications, etc | City Engineer | July-September 2006 | N/A |
| 6.9 | The Engineering and Traffic Division should publish their standard conditions of approval on the Public Works Department web site | City Engineer | July-September 2006 | N/A |

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| 6.10 | The processing of deeds for lot splits and consolidations from the Assessor's Office should be reengineered so that adjustments to property lines are made in GIS and not on vellum. The Assessor's Office should be responsible for processing of deeds and updating property lines in GIS resulting from lot splits and consolidations. | Finance Director | July-September 2006 | N/A |
| 6.11 | The City should acquire an automated permit information system | Finance Director | July-September 2006 | \$60,000 One-Time \$15,000 Ongoing |
| 6.12 | The Principal Civil Engineer position allocated to the Board of Public Works should be eliminated. | Public Works Director | July-September 2005 | (\$78,000) |
| 6.12 | Five professional and technical engineering positions should be authorized for traffic engineering. These positions should include a Principal Traffic Engineer. | Public Works Director | July-September 2005 | N/A |
| 6.12 | The Engineering and Traffic Division should develop and install a comprehensive traffic engineering program that includes traffic improvement and traffic safety engineering | Public Works Director | October-December 2005 | N/A |
| 6.12 | The Junior Civil Engineer allocated to the traffic engineering section at present should be upgraded to an Assistant Civil Engineer | Public Works Director | July-September 2005 | \$10,000 |
| 6.12 | Twelve professional and technical engineering staff should be authorized for engineering | Public Works Director | July-September 2005 | N/A |

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| 6.12 | The Traffic Permit Supervisor position, two Street and Engineering Foreman positions, and the Engineering Document Technician position should be reclassified within the engineering aide series. | Public Works Director | July-September 2005 | \$10,000 |
| 6.12 | Four of the seven vacant positions within the Engineering should be eliminated. | Public Works Director | July-September 2005 | (\$208,000) |
| 6.12 | The Deputy Director – Engineering position should be reclassified as the City Engineer, and recruitment for the position should begin immediately. | Public Works Director | July-September 2005 | N/A |
| 6.12 | A Junior Civil Engineer position should be reclassified as Principal Traffic Engineer, and recruitment for the position should begin immediately. | Public Works Director | July-September 2005 | \$10,000 |
| 6.12 | The Assistant Deputy – Operations for Engineering position should be reclassified as Senior Civil Engineer, and recruitment for the position should begin immediately. | Public Works Director | July-September 2005 | (\$5,000) |
| 6.12 | The two Laborer positions assigned to traffic signal maintenance and repair should be upgraded to Traffic Signal Technicians | Public Works Director | July-September 2005 | \$10,000 |
| 6.12 | Crew sizes for traffic signal maintenance and repair and sign maintenance and repair should be adjusted. | Public Works Director | July-September 2005 | N/A |
| 6.12 | Pavement legend painting should be insourced. | Public Works Director | July-September 2006 | (\$65,000) |
| 6.12 | The six vacant positions within Traffic should be eliminated. | Public Works Director | July-September 2005 | (\$312,000) |

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| 6.12 | One of the two positions assigned to the Conservation Commission should be eliminated. The Environmental Affairs Administrator should assume responsibility for NPDES implementation for the City. | Public Works Director | July-September 2005 | (\$52,000) |
| 6.13 | The Public Works Department should establish a preventive maintenance program for traffic signals. | Public Works Director | October-December 2005 | N/A |
| 6.14 | The City should renegotiate the contract with the Water and Sewer Commission to clarify that the Public Works Department shall provide design and construction inspection of the replacement of water and sewer mains | Finance Director | July-September 2005 | N/A |
| 6.15 | The Public Works Department should not waive its life-cycle pavement fees. Each utility, including the Water and Sewer Commission, should be required to pay the full amount. | Public Works Director | July 1, 2005 | \$190,000 in additional annual revenue |
| 6.15 | The life-cycle pavement fees should be increased to reflect current costs. | Public Works Director | October 1, 2005 | \$190,000 in additional annual revenue |
| 6.16 | The plan of organization should be modified. | Public Works Director | October 1, 2005 | N/A |
| Chapter 7 - Garage | | | | |
| 7.1 | The underutilized vehicles within the City's fleet that is maintained by the Public Works Department should be reduced. | Assistant Deputy Director-Garage | July-September 2006 | (\$100,000) |

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| 7.2 | A five year replacement plan should be developed for consideration of the Public Works Director and the Finance Director that identifies the units proposed for replacement over the next five fiscal years by unit number and the estimated cost per unit and by fiscal year | Assistant Deputy Director-Garage | October-December 2005 | N/A |
| 7.2 | The Assistant Deputy Director-Garage should develop a formal replacement policy for the City's fleet for the consideration of the Public Works Director and the Finance Director. | Assistant Deputy Director-Garage | October-December 2005 | N/A |
| 7.3 | The City should establish a fleet replacement fund | Finance Director | July-September 2006 | N/A |
| 7.4 | The Garage Division should be established as an internal service fund. | Assistant Deputy Director-Garage | October-December 2005 | N/A |
| 7.5 | The Garage Division should be authorized to fill one of the two vacant master mechanic positions, and the other vacant master mechanic position should be eliminated. | Public Works Director | July-September 2005 | (\$52,000) |
| 7.6 | The Welder position should be eliminated. | Public Works Director | July-September 2005 | (\$52,000) |
| 7.7 | The Assistant Deputy Director-Garage should be reclassified as Fleet manager and the roles and responsibilities of the position expanded. | Public Works Director | July-September 2005 | N/A |
| 7.8 | The Garage Division should utilize the State contract for purchase of light and medium equipment. | Public Works Director | July-September 2005 | N/A |

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| 7.9 | The Assistant Deputy of Operations should fully implement the capacity of the VHB Equipment Manager 2000 software system | Assistant Deputy Director-Garage | October-December 2005 | N/A |
| 7.10 | The vacant Principal Clerk Typist position should be filled and report directly to the Assistant Deputy of Operations. | Assistant Deputy Director-Garage | July-September 2005 | N/A |
| 7.11 | The software controls within Petro Vend should be restored and the Principal Clerk Typist position utilized to follow up with divisions and departments regarding inaccurate odometer readings and the reconciliation of inaccurate odometer data entered into the Petro Vend system. | Assistant Deputy Director-Garage | July-September 2005 | N/A |
| Chapter 8 – Solid Waste | | | | |
| 8.3 | The City should provide 90-days notice to the 405 businesses, 129 apartment buildings and 1,168 condominium units of its intent to terminate the provision of solid waste collection services, and the need for the owners to arrange for private collection services at their own expense | Public Works Director | October-December 2005 | N/A |
| 8.3 | The Solid Waste Division should cease collecting solid waste from the 405 businesses and 129 apartment buildings. The Solid Waste Division should eliminate one of its ten semi-automated collection route, and reduce staffing by 1.38 positions and reduce its side loader fleet by one truck. The Solid Waste Division should terminate its contract with Browning Ferris Industries to collect solid waste from condominiums | Public Works Director | January-March 2006 | (\$172,000) |

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| Index | Recommendation | Responsibility for Implementation | Timeframe for Completion | Cost Increase/(Savings) |
|--------------|--|--|---------------------------------|--|
| 8.4 | The Solid Waste Division should expand the number of automated collection routes | Assistant Deputy-Operations | October-December 2006 | N/A |
| 8.5 | The Solid Waste Division should expand the size of the routes for automated collection equipment to a range of 950 to 1,000 households per route per day. | Assistant Deputy-Operations | October-December 2006 | Cost savings identified under 8.10 |
| 8.6 | The crew size of the yard waste collection crews should be reduced from three to two staff, with these staff supplemented with sundry labor for the peak season. | Assistant Deputy-Operations | July-September 2005 | Cost savings identified under 8.10 |
| 8.7 | The Downtown Improvement District should provide mad Vac services. | Assistant Deputy-Operations | July-September 2005 | Cost savings identified under 8.10 |
| 8.8 | Provide litter barrel collection service one day a week with a one-person crew using a side loader truck. | Assistant Deputy-Operations | July-September 2005 | Cost savings identified under 8.10 |
| 8.9 | The crew size for truck 367 should be reduced from three persons to two persons | Assistant Deputy-Operations | July-September 2005 | Cost savings identified under 8.10 |
| 8.10 | The seventeen vacant positions within the Solid Waste Division should be eliminated. | Public Works Director | July-September 2005 | (\$884,000) |
| 8.11 | The Solid Waste Division should reduce wait times at the waste to energy plant for dumping loads | Public Works Director | October-December 2005 | N/A |
| 8.12 | The City should increase the fees for bulk collection | Public Works Director | October-December 2005 | \$500,000 in additional annual revenue |

| Index | Recommendation | Responsibility for Implementation | Timeframe for Completion | Cost Increase/(Savings) |
|-------------------------------------|--|--|---------------------------------|-----------------------------------|
| 8.13 | The City should implement a PAYT program. | Assistant Deputy-Operations | October-December 2005 | TBD |
| 8.14 | The Public Works Department should issue a request for proposal for solid waste collection using a managed competition approach. | Public Works Director | July-September 2005 | N/A |
| Chapter 9 – Streets Division | | | | |
| 9.1 | The Public Works Department should issue a request for proposal for street sweeping services using a managed competition process. | Public Works Director | July-September 2005 | N/A |
| 9.2 | The three positions assigned to the “yard” at 70 Tapley Street should be reallocated to routine pavement maintenance in the field. | Assistant Deputy-Operations | July-September 2005 | Cost savings identified under 9.8 |
| 9.3 | The City should outsource sidewalk replacement to the contractor performing sidewalk replacement as part of the capital improvement program. The City should outsource overlay preparation to the contractor awarded the bid for the overlay | City Engineer | October-December 2005 | \$100,000 |
| 9.4 | The work methods utilized for utility cut repair should be streamlined so that one crew removes the temporary patch and replaces it with a permanent patch | Assistant Deputy-Operations | July-September 2005 | Cost savings identified under 9.8 |
| 9.5 | The crew size for pothole patching should be reduced from three to two persons | Assistant Deputy-Operations | July-September 2005 | Cost savings identified under 9.8 |
| 9.6 | The Public Works Department should allocate twenty-three staff to routine ongoing pavement maintenance including pothole patching, skin patching, base repair, and crack sealing. | City Engineer | October-December 2005 | N/A |

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| Index | Recommendation | Responsibility for Implementation | Timeframe for Completion | Cost Increase/(Savings) |
|--|--|-----------------------------------|--------------------------|--|
| 9.6 | The Public Works Department should insource crack sealing. | City Engineer | October-December 2005 | (\$150,000) |
| 9.7 | The Public Works Department should modify the 24-hour coverage during winter months. | Public Works Director | July-September 2005 | Cost savings identified under 9.8 |
| 9.8 | Twenty-six vacant positions in the Streets Division should be eliminated. | Public Works Director | July-September 2005 | (\$1,350,000) |
| Chapter 10 – Towing and Storage | | | | |
| 10.2 | The Public Works Department should cease providing towed vehicle storage, and outsource towing and storage of vehicles, and the positions allocated to Towing and Storage eliminated. The Public Works Department should issue a request for proposal for towing and storage services. | Public Works Director | July-September 2005 | (\$102,000) |
| 10.3 | The Public Works Department should take the steps necessary to enable the City to levy and collect a \$250 fine for abandoned vehicles. | Public Works Director | October-December 2005 | \$235,000 in additional annual revenue |
| Chapter 11 – Water and Sewer | | | | |
| 11.1 | The Water and Sewer Division should utilize proper crew sizes for its work activities except in emergencies. | Public Works Director | July-September 2005 | Cost savings identified under 11.2 |
| 11.1 | The Water and Sewer Division should not clean out blockages of sewer connections or replace private sewer laterals or connections at the homeowner's request. | Public Works Director | October-December 2005 | Cost savings identified under 11.2 |
| 11.2 | The Water and Sewer Division should develop and install a preventive maintenance program for the water, sewer, and stormwater infrastructure. | Public Works Director | July-September 2005 | Cost savings identified under 11.2 |

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| Index | Recommendation | Responsibility for Implementation | Timeframe for Completion | Cost Increase/(Savings) |
|--------------|---|--|---------------------------------|---|
| 11.2 | The Water and Sewer Division should allocate seventeen staff to the preventive maintenance of the water distribution system and the sewer and stormwater collection systems. | Public Works Director | July-September 2005 | Cost savings identified under 11.2 |
| 11.2 | The Water and Sewer Division should allocate eleven staff to water distribution maintenance and repair | Public Works Director | July-September 2005 | Cost savings identified under 11.2 |
| 11.2 | Three staff should be allocated to sewer and stormwater collection system maintenance and repair. | Public Works Director | July-September 2005 | Cost savings identified under 11.2 |
| 11.2 | The Public Works Department should acquire a jet vactor for cleaning of storm drains. | Public Works Director | August 1, 2005 | \$185,000 in one-time capital outlay |
| 11.2 | Three Streets and Engineering Foremen, a Secretary, and a Utility Manager should be allocated to Water and Sewer Administration. | Public Works Director | July-September 2005 | Cost savings identified under 11.2 |
| 11.2 | Twenty-seven positions within the Water and Sewer Division should be eliminated. | Public Works Director | October-December 2005 | (\$1,404,000) |
| 11.3 | The Water and Sewer Division should outsource main installation and replacement | Public Works Director | October-December 2005 | \$500,000 |
| 11.4 | The City should renegotiate the contract with the Water and Sewer Commission to recover fringe benefit, indirect, and worker's compensation costs for staff in the Public Works Department allocated to the maintenance and repair of the water and wastewater infrastructure | Finance Director | July-September 2005 | \$850,000 in additional revenue at current staffing levels \$312,000 in additional annual revenue for staff on worker's compensation |
| 11.4 | The City should negotiate the specific tasks to be performed by the Water and Sewer Division on behalf of the Water and Sewer Commission. | Finance Director | July-September 2005 | N/A |

2. MANAGEMENT AND ADMINISTRATIVE SYSTEMS

2. MANAGEMENT AND ADMINISTRATIVE SYSTEMS

For fourteen years, the *Public Works Management Practices Manual*, published by the American Public Works Association, has been used by thousands of organizations in the United States to keep abreast of ever-increasing competition and to improve performance. In today's business environment, the *Public Works Management Practices Manual* help public works organizations respond to the rapid pace of innovation, focus on core competencies, and address the challenges of outsourcing. Whether an organization is small or large, is involved in limited or a wide range of public works services, or has one corporation yard or multiple yards, the *Public Works Management Practices Manual* provide a valuable framework that can help a public works organization plan in an uncertain environment. The *Public Works Management Practices Manual* should be used to assess performance on a wide range of key indicators including leadership, strategic planning, customer focus, information and analysis, human resources, fleet management, street maintenance, etc. This chapter evaluates managerial and administrative systems in the Public Works Department in light of the *Public Works Management Practices Manual* criteria, but also uses best practices from other organizations such as the American Water Works Association.

1. A NUMBER OF BEST PRACTICES FOR EFFECTIVE MANAGEMENT CONTROLS IN PUBLIC WORKS DEPARTMENTS WERE IDENTIFIED.

Good management systems and controls can help the Public Works Department provide safe, reliable infrastructure and services. The project teams review of industry publications, the *Public Works Management Practices Manual*, standards developed by the American Water Works Association, the Water Environment Research Foundation,

other professional associations, and discussions with management of the Public Works Department indicates that critical components of good maintenance management should include a number of elements, as follows.

(1.1) A Comprehensive Maintenance Plan

The adoption of a comprehensive maintenance plan is essential to the effective operation of public works infrastructure. The plan should establish overall maintenance goals, standards for the amount and frequency of work, and maintenance priorities. By defining the amount of maintenance effort that will be conducted, resource requirements can be more precisely estimated. The plan should identify long-term capital replacement needs, estimate the life of the infrastructure assets, and focus efforts on the most important maintenance tasks. The comprehensive plan should also provide benchmarks against which to measure the performance of the maintenance program in addressing goals and standards.

(1.2) Written Maintenance Policies and Procedures

Written maintenance policies and procedures provide specific guidance on how to carry-out the maintenance plan and perform activities such as hydrant flushing, valve management, and water main replacement. Written policies and procedures should be used to train new staff, ensure maintenance work is correctly and consistently performed, and improve productivity of work crews. Written policies and procedures also provide standards for judging the quality of maintenance work and guidance to contract work crews.

(1.3) Reliable, Easily Accessible Information on Assets

According to the American Water Works Association, the “collection and management of information is a key element in the successful operation of a water system. Information is the necessary link between the maintenance, operation and design aspects of water distribution system management.” Reliable information on the nature, function, location, age, and condition of system assets is needed to ensure effective communication and coordination within the organization; to plan, carry out, and manage maintenance and repair work; and to plan capital improvements and replacements. Up-to-date information in the form of maps and data must be readily accessible to all employees and is most effective when fully integrated into an electronic maintenance management system.

(1.4) Methods For Organizing and Scheduling Work

Public Works Departments also require efficient methods for organizing staff resources in work units and scheduling work crews. A centralized scheduling system should be used to prioritize, assign and track the status of assigned work. Managers can control job costs by monitoring the time and costs of specific job requests and reduce duplicative efforts. This system is also most effective when integrated into an electronic maintenance management system.

(1.5) Performance Goals and Monitoring

Effective management systems should also provide information so managers can actively monitor and measure the organization’s performance in meeting goals and objectives for quality, efficiency, and timeliness. Performance measures track the productivity of work crews, efficiency of maintenance work, and accomplishment of

maintenance plans. Performance reporting provides accountability to top management , the Mayor, and City Council and aids budget and operational decision-making. Moreover, monitoring performance trends over time provides early warning of maintenance backlogs, declining asset conditions, and need for corrective actions.

* * * * *

The next several sections of this chapter assess how effectively the Public Works Department meets these best practices.

2. THE PUBLIC WORKS DEPARTMENT SHOULD INSTALL A MAINTENANCE MANAGEMENT SYSTEM FOR HIGHWAYS, TRAFFIC, AND WATER AND SEWER.

The Public Works Department has not developed a comprehensive maintenance plan. While the department does utilize the legacy financial and human resource information system known as “Mapper”, this system has significant limitations. The “Mapper” information system only captures total hourly expenditures on particular job types.

The project team utilized data from “Mapper” to document crew sizes and work hours by work activity. The reporting of 304 hours and a cost of \$4,970.07 for “pothole patching” for the week ending March 26, 2005 (as was reported on the Weekly Time Report provided to the project team) is not a meaningful piece of information. There isn’t a definition of either the number of potholes repaired, the tonnage of asphalt used, the crew size utilized, or the response times associated with their repair. The total cost is not placed in a meaningful context of comparison in order to assess the relative efficiency with which the expenditures were made. Additionally, the cost reported captures only direct labor costs, and does not include indirect costs nor costs of

materials used, eliminating the department's ability to make comparisons to the private sector, other local governments or to benchmarks of efficiency.

The Public Works Department should acquire a commercial-off-the-shelf (COTS) maintenance management system and install this system for Highway, Traffic, and Water and Sewer. The legacy financial and human resource information system (Mapper), the City's financial information system, the system is not scalable and lacks the capacity to readily enable managers to answer such questions as the following:

- **Are Public Works Department Preventive Maintenance procedures working?** The management of the department should be able to look at total employee hours, grouped by work type or class comparing the amount of Emergency/Breakdown repairs to the amount of preventive maintenance work accomplished. This should enable management to assess the extent of a decline in Emergency/Breakdown repairs if preventive maintenance tasks are performed at the correct frequency. The Public Works Department in Springfield cannot answer this question using the data in Mapper.
- **Are Public Works Department preventive maintenance inspection frequencies adequate?** The management of the department should be able to look at the number of scheduled work orders grouped by work type or asset comparing the amount of work that was identified as a result of performing preventive maintenance (such as televised inspections of sewer mains or leak detection inspections of water mains) to preventive maintenance standards and guidelines promulgated by such organizations as the American Water Works Association. The Public Works Department in Springfield cannot answer this question using the data in Mapper.
- **Where are my problems in reliability and where should my maintenance department focus their limited resources?** The management of the department should be able to look at the total cost for work type or class Emergency/Breakdown and Call-In, sort the work requests by asset, and sort by location. This will identify by asset where all the costs are being accumulated. This is typically referred to as the "Top 10" list or "Bad Actors" report. This is essential in identifying where water or wastewater mains should be replaced, streets resurfaced, etc. The Public Works Department in Springfield cannot answer this question using the data in Mapper.
- **Where is maintenance spending their energy?** The management of the department should be able to look at the total employee hours grouped by work type or class. Depending on the established work types this will identify the type

of work that the maintenance organization is accomplishing. This is critical to ensure true maintenance work is being accomplished in support of production goals and targets. This data is available within Mapper.

- **What is our backlog of work?** The management of the department should be able to look at the backlog of work, assuring that there is no less than 2 weeks and no more than 4 weeks of backlog (all parts/materials available waiting scheduling) and between 4 to 6 weeks in the total backlog. The Public Works Department in Springfield cannot answer this question using the data in Mapper.
- **How efficient is our maintenance workforce?** The management of the department should be able to review the labor hours per work order and compare these to benchmarks that exist for the different work activities such as pothole patching, street sweeping, distribution valve exercising, etc. The Public Works Department in Springfield cannot answer this question using the data in Mapper.
- **How much money is our department spending on maintenance and repair for the various types of work activities?** This includes parts, material and supply costs, contractor costs, and maintenance labor costs. The management of the department should be able to look at the material cost, contractor cost, and labor cost grouped by work type. The Public Works Department in Springfield cannot answer this question using the data in Mapper.

A COTS maintenance management system should be acquired to serve as the basis of a comprehensive maintenance plan that identifies the services provided (e.g., traffic signal cabinet preventive maintenance), the levels of service (e.g., traffic signal cabinets are preventively maintained once a year), the outputs of each of these services (e.g., the number of traffic signal cabinets preventively maintained), and the costs of those service, both total and per unit of output. This is not an idealized perspective of what the Public Works Department should be doing, but a basic perspective of what is necessary to manage the maintenance and repair of the City's infrastructure.

There are a number of elements to the successful installation of a comprehensive maintenance plan by the Public Works Department of the City of Springfield. These elements include the following:

- **Asset Management.** An asset inventory must be developed. This data is the

constant of a successful comprehensive maintenance plan. Even if the latest technology tools have been implemented, a system without data is not very useful. Keeping asset information – features and location - up-to-date, accessible and understandable is the challenge of a successful comprehensive maintenance plan.

- **Work Management.** Work management includes all the activities involved in maintaining assets at a pre-defined condition level. The value of a successful comprehensive maintenance plan is its ability to recommend maintenance actions, such as which assets should be inspected or evaluated; and of those, which should have maintenance activities scheduled. Effective work management predicts and tracks the costs of labor, equipment and materials needed for maintenance and budget planning, and monitors the performance of actions taken.
- **Service Request Management.** As a starting point for many of the activities and work orders within a Public Works Department, service request management provides access to information such as citizen requests, work order generation and caller history. The ability to track the request(s) for work on an asset(s) provides a Public Works Department with the ability to keep better track of their data and in turn provide a better level of service to their citizens.
- **GIS Integration.** The term Geographic Information System (GIS) has often been used as the broad term to describe asset management. In reality, a GIS is only **one piece** of the process—without up-to-date supporting asset data it has limited use. However, linking a database and a GIS makes another level of management available by providing more options to analyze asset information.
 - **Visual information.** A GIS can display asset symbols on a map with links to their corresponding database records. The GIS provides the ability to analyze data based on geographic information, allowing patterns to emerge on a map that may not be as obvious in rows and columns of data.
 - **Communication.** Asset information can be shared in a visual format that is often better understood by others including the Mayor, City Council and the public.
 - **Asset location** Finding the location of an asset is faster and easier with the help of a map.

A COTS maintenance management system needs to be acquired for Water and Sewer, Highways, and Traffic. However, there are a number of steps that need to be accomplished before the COTS maintenance management system can be effectively

utilized in the development of this comprehensive maintenance plan. These steps are presented below.

(2.1) A Complete Inventory of Work Activities Performed by Water and Sewer, Highways, and Traffic Needs to Be Developed.

The Public Works Department needs to assure that all of the primary work activities (i.e., signal cabinet preventive maintenance, street sweeping, repairing water main leaks, pothole patching, snow and ice control, crack sealing, drainage inlet cleaning, pavement legend painting, etc.) that consume the majority of staff work hours are defined. This would include all forms of leave. All 2,080 staff hours for each employee should be included within the system.

(2.2) Performance Standards Need to Be Developed.

Performance standards are formally established criteria for determining the need for work, required quality of work, the resources necessary to achieve quality and expected rate of productivity, etc. Maintenance standards are developed for each maintenance activity.

Each performance standard should include, at a minimum, six components:

- A brief description of the specific work involved;
- The frequency with which the work should be performed (or the level of service);
- The crew size required for the job;
- The equipment, material, and tools needed;
- The performance expectations for each job or average daily productivity; and
- The recommended procedures for completing the job.

A sample performance standard for traffic signal cabinet maintenance is presented in the exhibit following this page.

| | | |
|----------------------------|---|------------------------|
| ACTIVITY NO: 101 | ACTIVITY NAME: Traffic Signal Cabinet Maintenance | DATE: Jan 99 |
|----------------------------|---|------------------------|

ACTIVITY DESCRIPTION:

Traffic signal cabinet maintenance includes the inspection, testing, cleaning and adjustments made to the traffic signal electronic equipment cabinet.

PERFORMANCE CRITERIA:

PRIORITY SERVICE

Preventative maintenance activity to be scheduled

SCHEDULED MAINTENANCE

Cabinet Maintenance will be performed twice annually

TYPICAL CREW SIZE:

1 Person

WORK METHOD:

- ❖ Test conflict monitor with computerized tester, record results.
- ❖ Vacuum cabinet, open controller door, blow out controller
- ❖ Check timing on controller
- ❖ Spray cabinet with bug spray
- ❖ Check condition of cabinet documentation, replace as necessary
- ❖ List cabinet equipment on inventory sheet
- ❖ Check operation of vehicle loop detectors, tune if necessary
- ❖ Visually inspect loops and test pedestrian pushbuttons
- ❖ Check operation of cooling fan, set to 100°F
- ❖ Lubricate door locks

EQUIPMENT:

| | | | |
|-------------------------|-----------------------|----|-------|
| Hand tools | Vacuum Cleaner | or | 1 Van |
| Conflict monitor tester | compressed air bottle | | |

MATERIAL:

| | | |
|--------------------------|---------------|------------|
| Non-conductive bug spray | Timing sheets | Checklists |
|--------------------------|---------------|------------|

PRODUCTION STANDARDS:

- ◆ UNIT OF MEASUREMENT: Cabinets
- ◆ AVERAGE DAILY PRODUCTION: 10
- ◆ MAN HOURS PER WORK UNIT: 1.0

(2.3) An Annual Work Plan Needs to Be Developed.

An annual work plan needs to be developed within the COTS maintenance management system that will not only guide Water and Sewer, Highways, and Traffic in prioritizing and performing specific tasks, but will provide the managers within Water and Sewer, Highways, and Traffic with a document to hold their staff accountable for results.

The annual work plan estimates the kind and amount of work to be done in the next fiscal year. The managers in these programs should prepare the annual work plans as part of the budgetary preparation process. The development of an annual work program takes into consideration two major questions:

- What amount of work is needed to provide the desired levels of service to the public?
- What required levels of staff, equipment, and materials will be needed to provide that level of service and at what cost?

The annual work program is prepared once a year and serves as a planning document that established objectives for the coming fiscal year in terms of the specific work activities to be performed, the service levels to be provided, and the allocation of staff in the provision of these services. It provides a clear indication of the relationship between funding and service levels. It also serves as a valuable tool to model trade-offs between different funding levels and the level of service that can be provided.

The process for development of this annual work plan, outlined in the exhibit following this page, will fundamentally change the focus of managers and first-line supervisors in Water and Sewer, Highways, and Traffic from their current roles of field

MANAGEMENT REQUIREMENTS FOR THE THE DEVELOPMENT OF AN ANNUAL WORK PLAN

| Component in the Development of the Annual Plan | Requirement | Responsibility |
|--|---|---|
| Identification of Information Sources and Needs | <ul style="list-style-type: none"> The Divisions should analyze the sources of information available in its determination of feasible service level targets. These include the daily work orders generated by each crew. Work orders should be re-examined and re-designed to ensure the consistent, and comprehensive, capture of activity data between the component Units within the Division. | <ul style="list-style-type: none"> Although this step should be initiated by the Deputy Directors and Assistant Deputy of Operations for each unit, it should involve, initially, the first-line supervisors as well. |
| Analysis of Historical Trends in Services Provided | <ul style="list-style-type: none"> The Divisions should determine the levels of service which have been provided in previous years in order to proceed to the next step in the process, which is the determination of appropriate "targeted" service levels commensurate with the resources available. This analysis should result in a historical listing of inputs as well as outputs for each service or activity. Examples include numbers of person-hours expended by work task such as pothole patching, signal cabinet preventive maintenance, etc. This analysis will require a thorough review of the Division's data within the CMMS in order to extract person-hour data by activity. | <ul style="list-style-type: none"> Although the analysis may be delegated to first-line supervisors, the effort should be initiated by the Deputy Directors and Assistant Deputy of Operations for each unit. The Assistant Deputy of Operations – currently assigned to Towing and Storage - should provide analytical assistance. The Public Works Director should be consulted in the process to ensure that proposed service levels are appropriate |
| Service Level Needs Analysis | <ul style="list-style-type: none"> After the development and presentation of the "raw data" regarding historical trends, this trend data should be matched against available resources to determine the feasible targeted service levels for each activity. Input factors such as optimal crew sizes, required work, numbers of citizen requests, equipment availability, and others will be utilized in this determination. The result of this step will be a definition of feasible targeted service levels for each activity type, as well as a priority listing of activities that are most critical for the Divisions to accomplish. This definition represents the foundation for future analyses that will focus upon the acceptability of the defined service | <ul style="list-style-type: none"> Deputy Directors Assistant Deputy of Operations First-line supervisors The Public Works Director should provide input into the process to ensure that priorities for work accomplishment are in accordance with Departmental expectations. |

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| Component in the Development of the Annual Plan | Requirement | Responsibility |
|--|--|---|
| | levels, and the resulting refinement of resources needed, or alternatively, the need to reallocate existing resources to higher-priority activities. | |
| Identification of Personnel and Equipment Resources Needed to Accomplish Targeted Service Levels | <ul style="list-style-type: none"> This step will be the natural result of the preceding step. The Divisions may, after analyzing historical trends and available staff and equipment resources, find that there is a “mismatch” between feasible and desired service levels. Refinements will be made, and will lead to the next step, which is the development of budgetary needs commensurate with the targeted service levels. | <ul style="list-style-type: none"> Deputy Directors Assistant Deputy of Operations First-line supervisors The Public Works Director should provide input into the process to ensure that priorities for work accomplishment are in accordance with Departmental expectations. |
| Development of Program Budgets | <ul style="list-style-type: none"> This step represents the relatively mechanical process of developing program budgets for each of the activities provided by the Division. It is important to note that this step should entail a routine examination of the feasibility of outsourcing specific functions, either due to the relative cost of in-house performance, or to the inability to accomplish certain tasks, defined in the work plan, with existing resources. The development of the Division budget, therefore, is the result of an analysis of the work activities and service levels, as opposed to the projected escalation of expenses for the Division as a whole, based on the previous years' expenditures. | <ul style="list-style-type: none"> Deputy Directors Assistant Deputy of Operations First-line supervisors. The Public Works Director should be responsible for guiding the process, and for assembling and presenting the final budget package to the Mayor and Finance Director. The Public Works Director will also be responsible for making decisions regarding budgetary reductions, additions or reallocations between Divisions prior to the development of the final package. |
| Activity Monitoring and Reporting | <ul style="list-style-type: none"> Once targeted service levels have been defined and budgets established for each activity, each Deputy Director, Assistant Deputy of Operations, and first-line supervisor should receive weekly and monthly reports regarding work accomplished, work planned, and any resulting variations from the plan. Variances from the plan must be documented, with a narrative explaining the impact on the Division's ability to meet performance targets. Corrective actions must be defined. | <ul style="list-style-type: none"> Deputy Director and Assistant Deputy of Operations should be responsible for monitoring of budgets and work accomplishment according to plan, for each of their assigned areas. Monthly meetings with the Public Works Director should be planned. These meetings should focus on variances from plans, and the corrective actions necessary. |

| Component in the Development of the Annual Plan | Requirement | Responsibility |
|--|--|--|
| Management of Resources | <ul style="list-style-type: none">• The reporting of time, activities and expenditures should not be a strictly reactive function. Refinements must be made to the allocation of resources as it becomes clear that problems have surfaced. Examples of problems that may legitimately cause deviations from original plans may include weather related problems, unforeseen employee absences or turnover, or cost/labor issues with contractors. | <ul style="list-style-type: none">• Deputy Director and Assistant Deputy of Operations should monitor these issues daily and make refinements. |

supervision to that of management of resources in order to ensure conformance with the annual work programs.

As the previous exhibit indicates, Water and Sewer, Highways, and Traffic should establish service levels for each of the work activities and services they provide. Further, once these targeted service levels are established, with staffing, Water and Sewer, Highways, and Traffic should report on the planned and accomplished work on a monthly and annual basis using the COTS maintenance management system.

A sample of an annual work program is presented in the exhibit following this page. As the exhibit indicates, Water and Sewer, Highways, and Traffic should establish service levels for each of the work activities and services they provide. Further, once these targeted service levels are established, with staffing, Water and Sewer, Highways, and Traffic should report on the planned and accomplished work on a monthly and annual basis using the COTS maintenance management system.

(2.4) A Monthly Performance Report Should Be Generated Comparing Planned Versus Actual Performance and Costs.

A sample monthly report is presented in the second exhibit following this page. The monthly report should be generated by the automated work order system. It should be designed to enable:

- A comparison of planned versus actual staff hours per work activity for the previous month and year-to-date for each work activity;
- A comparison of actual versus planned work output (miles of curbs swept by street sweepers) per month and year-to-date for each work activity;
- A unit cost analysis that compares the planned versus actual unit costs for each work activity per month and year-to-date; and

Sample Annual Work Program for Maintenance Operations

| Work Activity | Quantity | Inventory Unit | Effort Level | Work Quantity | Work Unit | ADP | Crew Days | Crew Size | Labor Days | Labor \$ | Equip. \$ | Mat'l \$ | Total \$ |
|---|----------|----------------|--------------|---------------|--------------|-------|-----------|-----------|--------------|------------------|-----------------|-----------------|------------------|
| Program 01 – Street Maintenance Administration | | | | | | | | | | | | | |
| Vacation | 2,200 | Labor Hour | 1.0 | 2,200.0 | Labor Hour | 24.0 | 91.7 | 3.0 | 275.0 | \$68,750 | \$0 | \$0 | \$68,750 |
| Other Time Off | 800 | Labor Hour | 1.0 | 800.0 | Labor Hour | 32.0 | 25.0 | 4.0 | 100.0 | \$25,000 | \$0 | \$0 | \$25,000 |
| Sick | 800 | Labor Hour | 1.0 | 800.0 | Labor Hour | 28.5 | 28.1 | 3.6 | 101.1 | \$25,263 | \$0 | \$0 | \$25,263 |
| Meetings/Training | 850 | Labor Hour | 1.0 | 850.0 | Labor Hour | 30.0 | 28.3 | 3.7 | 104.8 | \$26,208 | \$1,784 | \$0 | \$27,992 |
| Program Totals | | | | | | | | | 580.9 | \$145,221 | \$1,784 | \$0 | \$147,005 |
| Program 02- Pavement Maintenance and Repair | | | | | | | | | | | | | |
| Pothole Patching | 420 | Lane Mile | 0.6 | 252.0 | Tons | 2.8 | 90.0 | 2.0 | 180.0 | \$45,000 | \$19,008 | \$19,548 | \$83,556 |
| Remove/Replace Base | 420 | Lane Mile | 6.0 | 2,520.0 | Sq. Yds | 62.5 | 40.3 | 3.0 | 121.0 | \$30,240 | \$13,862 | \$10,777 | \$54,879 |
| Skin Patching | 420 | Lane Mile | 55.0 | 23,100.0 | Sq. Yds | 218.0 | 106.0 | 3.0 | 317.9 | \$79,472 | \$59,315 | \$52,830 | \$191,617 |
| Crack Sealing | 420 | Lane Mile | 5.0 | 2,100.0 | Lbs. Sealant | 350.0 | 6.0 | 3.0 | 18.0 | \$4,500 | \$3,586 | \$1,775 | \$9,861 |
| Program Totals | | | | | | | | | 636.8 | \$159,212 | \$95,771 | \$84,930 | \$339,913 |

SAMPLE PERFORMANCE REPORT

Year-to-Date Work Progress Report for Maintenance Operations Period: July 1, 2004 – July 30, 2004

| Work Activity | Labor Days | | Amount of Work | | Total Cost | | Productivity | |
|---|------------|--------|----------------|--------------|------------|---------|----------------------------|----------------------------|
| | Plan | Actual | Plan | Actual | Plan | Actual | Plan | Actual |
| <i>Program: 08 – Pavement Maintenance</i> | | | | | | | | |
| Pothole Patching | 15 | 18 | 42 tons | 40 tons | \$6,963 | \$7,862 | 2.8 tons per crew day | 2.4 tons per day |
| Remove/ Replace Base | 10 | 26 | 210 Sq. Yds. | 456 Sq. Yds. | \$4,573 | \$9,602 | 62 ½ Sq. Yds. Per crew day | 68 ½ Sq. Yds. Per crew day |

- A comparison of actual productivity (work output per staff hour) versus the expected productivity as stated in the performance standards.

Unfortunately, some asset management systems are unsuccessful or fail to even make it off the ground. The points below present common pitfalls to which Public Works Departments, without the proper planning, often fall victim. Anticipating these challenges will help an organization head off any potential problems and ensure the success of its management system.

- **Unclear Goals.** Having unclear goals and conflicting priorities lead to a system that will not satisfy the needs of the Public Works Department. Identify the short- and long-term goals that the system is expected to produce and prioritize these.
- **Failure to Implement in phases.** It is important to start small and implement a maintenance management system that first meets the Public Works Department's immediate goals. Additional data, procedures and tools can be added in the future. This is especially important if a Public Works Departments has limited resources.
- **Under Estimating the Investment.** Underestimating the money, employee resources and length of time required to implement a maintenance management system is common. Be sure to budget dollars accordingly, planning not only for immediate expenses, but to maintain, update and enhance the system. Carefully planning the implementation process and the ongoing daily operations will help an organization realistically understand expectations, projected timeframes and associated costs. Data is an investment and has real value.
- **Bad Data.** The quantity of data is not as important as the quality of data. Too much data can be a hindrance—and inaccurate or inconsistent data cannot be processed or utilized effectively. The Public Works Department should start with the most crucial elements and determine the standards for recording this information. The system can be expanded in the future by collecting additional fields of data.
- **The Maintenance Management System Is Not Maintained.** A system can't remain effective if it fails to be used according to procedure and does not receive periodic evaluations and enhancements. Relying on a single person – such as the Communications Technician - to carry the ongoing weight of keeping the system up and running is also a mistake. It is necessary that all managerial and supervisory levels within the Public Works Department accept and adopt this new discipline and practice it daily, much like the department has already accomplished with its snow operations information system. Without this

commitment, the results will ultimately fall short of the defined goals.

- **Failure to Plan For the Future.** The system that is in use today is not the system that will be needed tomorrow. Systems that were selected based on price alone or for features that meet only the current goals are often inflexible - prohibiting the exchange of information with other agencies or departments. These systems are often difficult or impossible to expand or upgrade as needs change. The Public Works Department should define long-term goals and make sure the decisions made today by the department help reach those goals and will not hinder the process.

The estimated costs for acquisition of COTS maintenance management software necessary to support the maintenance management system are presented below.

- The City should seek concurrent licenses, not “per seat” licenses for the system.
- The project team estimates that the Public Works Department will ultimately need approximately 15 to 20 concurrent licenses. The cost for these licenses will cost approximately \$135,000.
- Initially, however, the department should phase in implementation with one division only – such as Sewer. The cost for the initial set of 5 concurrent licenses would approximate \$15,000.
- The annual licensing for the 15 to 20 concurrent licenses will approximate \$35,000 annually. This cost would not occur until the 2nd year.
- Training should be provided to the staff that would be utilizing the system. The estimated cost for on-site training would approximate \$1,750 per day, and an estimated three to five days training would be required or a total cost approximating \$8,750.
- Technical assistance from the vendor for setting the system up and installing the system would cost approximately \$5,000.

Approximately 40% of this cost should be allocated to the Water and Sewer Commission.

Recommendation: The Public Works Department should develop and install a maintenance management system for the Highway, Traffic, and Water and Sewer.

Recommendation: The Assistant Deputy of Operations – currently assigned to Towing and Storage - should provide assistance in the development and installation of the maintenance management system.

Recommendation: The Public Works Department should acquire commercial off-the-shelf maintenance management software.

3. THE PUBLIC WORKS DEPARTMENT SHOULD ENHANCE ITS GOALS, OBJECTIVES, AND PERFORMANCE MEASURES, AND DEVELOP PERFORMANCE REPORTING SYSTEMS.

The City of Springfield, and the Public Works Department, has recently begun to develop goals, objectives and performance measures. The department has lacked goals, objectives, and performance measures previously. The goals, objectives and performance measures developed by the department include:

- A departmental mission statement;
- Programs such as Engineering, Street Services, etc.;
- Goals for the program;
- Activities for the program such as street sweeping, snow and ice control, public way (street) maintenance, sidewalk replacement, storm water, private way maintenance, etc.;
- Goals for the activities such as “provide clean and aesthetic streets throughout the City and reduce the amount of sediment and debris that enters the receiving waters”; and
- Output, efficiency, and effectiveness measures.

This is a solid first effort by the Public Works Department in the development of goals, objectives, and performance measures.

In evaluating this initial effort by the Public Works Department, the project team utilized Government Finance Officer’s Association Recommended Budget Practices. These practices include a number of principles for the development of goals, objectives, and performance measures including:

- Develop broad goals to guide government decision making;

- Develop approaches to achieve these goals including specific policies, plans, programs, and management strategies;
- Develop a budget consistent with approaches to move towards achievement of the goals recognizing the constraints of available resources; and
- Assess performance and make adjustments including monitoring, measuring, and assessing performance.

These practices indicate that the Public Works Department and the City of Springfield should enhance their initial efforts in the development of goals, objectives and performance measures. These enhancements encompass the following areas.

- **The City should develop citywide goals to guide the development of departmental goals and objectives.** The purpose of the citywide goals is to establish an agreement and common understanding of citywide goals and how the various parts of the City organization shall contribute to achieving those goals.
- **The activities and activity goals of the Public Works Department should address how the department will resolve service level gaps.** For example, the department is not preventively maintaining the water and sewer infrastructure. The department has not evaluated the condition of the City's streets on a comprehensive basis for at least five years. The City is collecting refuse from condominiums and commercial businesses, when it has no legal obligation to provide that service. The department is not expanding the extent of automated solid waste collection routes. The department has not implemented a Pay As You Throw program when other cities in Massachusetts, such as Brockton and Worcester, have implemented such programs. The activity goals developed by the Public Works Department should be developed within the context of existing service level gaps and the strategies of the department to address these service level gaps.
- **The output measures developed by the Public Works Department should include the levels of service.** For example, the level of service for street sweeping could be to sweep all streets within the City once a month from April through December. A level of service for snow plowing of residential streets could be to plow residential streets when 3" of new snow is on the ground. The level of service for pothole patching could be responding to citizen requests for pothole patching within one workday of the receipt of the request. The level of service for catch basin cleaning could be to clean all catch basins annually.
- **The activity goals should be expanded to encompass preventive maintenance of the infrastructure.** In some areas, there are omissions that

should be addressed. For example, within the Traffic program, there isn't an activity for preventive maintenance of signal control cabinets or an activity for the frequency or the service level for street striping.

- **Goals, objectives, and performance measures need to be developed for water and wastewater.** The department has not yet developed any goals, objectives, and performance measures for these two programs.
- **The Public Works Department has not developed policies and procedures for the reporting and evaluation of actual versus planned performance.** The department has not identified how often the data regarding performance measures will be collected and reported, and the managers responsible for collecting and reporting actual versus planned performance, and how the data will be utilized to evaluate the performance of the divisions within the Public Works Department.
- **The goals, objectives, and performance measures should be posted to the Public Works Department web site.** The department should provide the public with an understanding of the department's goals and objectives, and how it plans to focus scarce City resources on the priorities of the City and the department.

The Assistant Deputy of Operations – currently assigned to Towing and Storage - should be assigned responsibility for providing training and technical assistance to the department's managers in the development of goals, objectives, and performance measures.

Recommendation: The Mayor's office should develop City goals to guide the development of departmental goals and objectives.

Recommendation: The Public Works Department should enhance their goals, objectives, and performance measures.

Recommendation: The Assistant Deputy of Operations – currently assigned to Towing and Storage - should provide assistance in the enhancement of the goals, objectives, and performance measures.

4. THE DEPARTMENT SHOULD DEVELOP AN INFORMATION TECHNOLOGY STRATEGIC PLAN.

The near explosive expansion of technology, the advent of PDA technology and applications, and increasing demands for technology in the field to support field operations--all part of the information revolution--intensify the need to look at a full array of information technologies (data, voice, image) and the needs of the Public Works Department over the next several years. These are all reasons to develop an information technology strategic plan: to focus scarce resources where they will have the greatest and most beneficial impact. The information technology (IT) strategic plan should have a three-year horizon, but should be updated every fiscal year. The Assistant Deputy of Operations – currently assigned to Towing and Storage - and the Communications Technician should be assigned responsibility for development of the plan.

The department should utilize the following approach in developing their information strategic plan.

- **Briefly describe the major business challenges and how the Department plans to use information technology (IT) to contribute to overcome these challenges.** These include such challenges as scarce staff resources, the absence of preventive maintenance, pressures to reduce unit costs, etc.
- **Describe the primary business objectives for the next three years (or for that time frame for which they are formally established).** This serves as the point of reference for IT strategies and tactics required in the departmental IT plans.
- **Describe the department's IT strategies to support the business functions of the department.** An IT strategy is a statement of direction, approach, and/or method as to how the department will apply IT to achieve its business functions.
- **Describe the department's IT standards.** The department should describe the IT standards that it will utilize as the basis for its IT strategies such as standardizing on modern Structural Query Language (SQL) relational DBMS.

- **Describe all department IT projects which will have an estimated development and implementation cost (not operations) of \$25,000 or more and that will be submitted to the City Council for approval to begin in or continue into the next three fiscal year(s).** A project is defined as an expenditure of resources to build and implement an IT based product or service or the capability to provide a IT based product or service. Examples of such activities involve software applications, IT equipment, IT training and planning. Include all IT projects meeting this threshold regardless of source of funds or funding category.
- **The department should develop a plan for IT expenditures requirements over the three-year plan.** The annual budget should account for the total cost of Departmental IT ownership. The budget and the Department's IT plans should include the following costs:
 - Current and on-going hardware acquisition and maintenance;
 - Infrastructure acquisition and maintenance;
 - Software acquisition and maintenance; and
 - Staff training.

In developing this information technology strategic plan, the department should take the following steps:

- The department should establish a technology committee consisting of five to seven staff that includes representation of managers from all divisions. The technology committee should conduct an assessment to identify department and division-level technology needs, as well as barriers to non-use.
- Based on the needs assessment, the technology committee should recommend departmental technology priorities, review and make recommendations on major information systems projects for the department, and make recommendations for, and monitor the implementation of, the department technology plan.

Recommendation: The Public Works Department should develop an information technology strategic plan with a three-year time horizon, and update this strategic plan annually.

Recommendation: The Public Works Department should establish a technology committee consisting of five to seven staff that includes a representation of managers from all divisions.

Recommendation: The Assistant Deputy of Operations – currently assigned to Towing and Storage - and the Communications Technician should be assigned responsibility for development of the plan working with the committee.

5. THE DEPARTMENT SHOULD DEVELOP WRITTEN POLICIES AND PROCEDURES TO GUIDE MANAGERS AND SUPERVISORS.

The Public Works Department has developed a number of policies and procedures. These include such examples as the following:

- A policy and procedure for the asphalt patching program developed in 1999;
- A commercial driving license policy developed in 1999;
- An employee handbook developed in 2001;
- An employee absence monitoring program developed in 2002 that is still marked as draft;
- An excavation and work zone safety policy and procedure developed in 2002;
- A snow and ice control policy developed in 1998 and updated in 2005;
- A supervisors guide to progressive discipline developed in 1995; and
- A temporary alternative work program policy and procedure developed in 1995 and updated in 2002.

The Public Works Department should consolidate these policies and procedures into a manual to guide its managers and first line supervisors and assure uniformity in decision-making processes of the department.

In developing the policies and procedures manual for the Public Works Department, the following approach should be utilized.

- The department should establish a committee consisting of five to seven staff that includes representation of managers from all divisions to develop, update, and evaluate its policies.
- The committee should annually recommend changes and updates to the department's policies and procedures that are needed to reflect changes in law, city or department action.

- The Public Works Director should review, change (if necessary), and adopt the committee's recommended changes to district policies.
- The department's policies and procedures should be and readily accessible to all departmental staff by placing them on the department's Intranet.
- The City Solicitor should review all proposed policies and procedures revisions to ensure that they comply with State and City requirements and are relevant and complete.

The Assistant Deputy of Operations – currently assigned to Towing and Storage - should be assigned responsibility for technical support to the department's managers in the development of the policies and procedures manual.

Recommendation: The Public Works Department should establish a policy and procedure committee consisting of five to seven staff that includes a representation of managers from all divisions.

Recommendation: The Assistant Deputy of Operations – currently assigned to Towing and Storage - should be assigned responsibility for development of the policies and procedures manual working with the committee.

6. THE PUBLIC WORKS DEPARTMENT SHOULD ENHANCE ITS EMPLOYEE SAFETY PROGRAM.

In 2003, the Public Works Department lost 1,249 days away from work as a result of injuries on-duty suffered by its employees in 47 separate cases or incidents. This amounts to 15.8 incidents per 100 employees (assuming 298 employees identified in the report Department of Public Works Time Lost Report By Division). In 2004, the Public Works Department lost 870 days away from work as a result of injuries on duty suffered by employees in 24 separate cases or incidents. This amounts to 7.9 incidents per 100 employees (assuming 303 employees identified in the report Department of Public Works Time Lost Report By Division). The incidence rate in 2003 was much higher than comparable employers. The incidence rate in 2004 was a significant

improvement of these incidence rates, but is still higher than comparable employers. In 2002 – the most current year for which occupational injury and illness data is available in Massachusetts – the incidence rate per 100 employees for electric, gas, and sanitary services was 6.8 total recordable cases per 100 employees. This industry category was selected as most comparable to the risks encountered by the employees of the Public Works Department. Approximately 6% of the department's employees are on worker's compensation at the present time.

The Public Works Department has established numerous employee safety policies and procedures. These include policies related to vehicle accident review, hazard communication, heat stress, excavation and work safety, commercial driver's license, etc.

The department does not have an employee safety program, however. There are a number of elements, essential to effective employee safety programs, absent from the Public Works Department. These elements are presented below.

- The department has not established goals, objectives, and performance measures for its employee safety program. These could include such objectives as the Total number of recordable injuries and illness cases per 100 full-time employees shall be less than the average for local governments in Massachusetts as reported by the Division of Occupational Safety of the Commonwealth of Massachusetts.
- The role of the Safety Inspector has been ill-defined in obtaining corrective action by supervisors and managers to assure employee safety
- The department has not established a separate line-item budget for safety services and supplies.
- The department does not have an employee safety committee.
- No on-site work inspections or inspections of the facilities at 70 Tapley Street have been conducted since 2003 by the Safety Inspector to assess employee safety at the work site and at 70 Tapley Street and develop recommendations to

enhance employee safety. The Safety Inspector does not audit the effectiveness of work practices in the field or at 70 Tapley Street to assure safe work practices are utilized.

- The Safety Inspector has not provided any training to departmental staff in three years.
- The department has not developed any tailgate safety training modules for delivery by first-line supervisors.

There are clearly a number of opportunities by the Public Works Department to improve its employee safety program.

Recommendation: The Public Works Department should enhance its employee safety program.

7. THE PERSONNEL DEPARTMENT SHOULD ENHANCE THE EMPLOYEE SELECTION PROCESS AND THE RETURN-TO-WORK PROGRAM.

The Public Works Department cannot be effective in management of the impact of worker's compensation on its ability to accomplish its goals and objectives without the effective guidance and support of the Personnel Department. At present, the Public Works Department faces four significant obstacles in accomplishing its goals and objectives. These obstacles are presented below.

- **The Personnel Department does not utilize a physical capabilities demonstration as part of the examination process for positions in the Public Works Department.** The Public Works Department has a number of occupations that require high levels of physical capabilities such as solid waste collection, street maintenance, etc. The Personnel Department should utilize a physical capabilities demonstration examination to identify candidates who have sufficient strength and endurance to perform the physical job aspects of these occupations. The physical capabilities demonstration examination should test upper body strength, lower body strength, manipulative coordination, flexibility, and physical stamina. This examination should involve a series of examinations, each representing a physical activity that a typical Semi-Automated Driver, Heavy Equipment Operator, Refuse Collection Laborer, Skilled Laborer/Medium Equipment Operator, etc. would encounter during the performance of their duties. The project team recommends that the physical agility test should comprise a significant proportion of the total exam score for these occupations.

- **The Personnel Department does not utilize an effective return-to-work management system for employees that were injured on duty.** Effective return-to-work programs can have significant benefits for employers. Research cited by PERI indicates that the return on investment for employers is \$9 for every \$1 spent in implementing a return to work program. The effective return-to-work programs include such elements as the following:
 - Citywide written policies and procedures for the return-to-work program;
 - Pre-identified modified duty options have been developed;
 - Management and supervisory training in the return-to-work program has been provided;
 - An employee is assigned by the Personnel Department to the return-to-work program to coordinate activities among stakeholders;
 - A case management information system/database is utilized;
 - Immediate intervention is provided by the Personnel Department on the day of the injury to direct medical treatment, provide a nurse “first call” service, etc.;
 - An early intervention response is provided from the first day that includes pre-identified transitional, modified duty options, physician review and intervention, etc.;
 - Problem case intervention is provided with ongoing and frequent dialogue and meetings with employee;
 - If the likelihood of employee return to duty is extremely low, the case is settled and closed.
- **Employees stay on worker’s compensation for lengthy periods of time and the Public Works Department has little influence over the actions taken to encourage employees to return-to-work.** On February 23, 2005, there were seventeen employees of the Public Works Department on worker’s compensation. Three of these worker’s went on worker’s compensation within six months of being hired by the Public Works Department. The seventeen employees represents approximately 6% of the filled positions within the Public Works Department.
- **Departments in Springfield have little incentive to assertively pursue an effective return-to-work program since the salary costs of employees on workers compensation are absorbed by the Personnel Department.** This equation would change if the department whose employee was on worker’s

compensation absorbed these costs.

- **Former employees on disability retirements are, in many instances, collecting workers compensation as well.** This may not be appropriate in all instances.

The seventeen employees on worker's compensation represent approximately \$1 million in salary and fringe benefit costs to the City of Springfield.

Recommendation: The Public Works Department should enhance its employee safety program.

Recommendation: The Public Works Department should reduce its incidence rate for OSHA-recordable injuries to approximately 7 injuries per 100 employees – a reduction of more than half its current rate.

Recommendation: The Personnel Department should develop and install a physical agility examination for those occupations with significant physical demand such as Semi-Automated Driver, Heavy Equipment Operator, Refuse Collection Laborer, Skilled Laborer/Medium Equipment Operator, etc.

Recommendation: The Personnel Department should enhance the return-to-work management system for employees that were injured on duty.

Recommendation: The Personnel Director should meet with the Public Works Director on a monthly basis to discuss the actions being taken to resolve issues associated with returning employees on worker's compensation to work.

Recommendation: The cost of employees on worker's compensation should be allocated to the department whose employee is on worker's compensation.

Recommendation: The Personnel Department should identify and evaluate the appropriateness of every former employee collecting both disability retirement and workers compensation.

7. THE PROCESS FOR APPROVING THE FILLING A VACANT POSITION IN THE CITY SHOULD BE REENGINEERED.

The current process the City of Springfield uses to approve the filling a vacant funded position is presented below.

- The department prepares a Request to Fill form.
- The Request to Fill form is forwarded to the City Auditor for funding verification

and authorization.

- The Request to Fill form is forwarded to the Chief Financial Officer for funding verification and authorization.
- The Request to Fill form is forwarded to the Mayor for and authorization.
- The Request to Fill form is forwarded to the Personnel Department.
- The Personnel Department forwards the Request to Fill Form to the originating department.
- The department posts the position in-house for seven days.
- If an in-house candidate is selected by the department, a personnel requisition is completed by the department and forwarded to the Personnel Department.
- The Personnel Department develops an eligibility list through a recruitment and examination process, or utilizes an existing eligibility list.
- The Personnel Department arranges interviews for those candidates that are on the eligibility list.
- The originating department interviews candidates for the vacant position.
- The department interviews applicants and makes a selection.
- The department notifies the Personnel Department and sends the applicant a letter to report the Personnel Department for a pre-employment physical examination.
- Upon passing the physical examination, the applicant reports to work.

This is a difficult and lengthy process that should be reengineered. The proposed process is presented below.

- The process for the Request to Fill should be eliminated altogether.
- The department should complete a personnel requisition.
- The personnel requisition should be forwarded to and approved by the Auditor's Office in terms of being a funded position. The personnel requisition should then be forwarded to the Personnel Department.
- The Personnel Department develops an eligibility list through a recruitment and

examination process if an existing eligibility list does not exist, or utilizes an existing eligibility list.

- The Personnel Department arranges interviews for those candidates that are on the eligibility list.
- The originating department interviews candidates for the vacant position.
- The department interviews applicants and makes a selection.
- The department notifies the Personnel Department and sends the applicant a letter to report the Personnel Department for a pre-employment physical examination.
- Upon passing the physical examination, the applicant reports to work.

Recommendation: The process for filling vacant funded positions should be streamlined.

8. THE CITY SHOULD REPLACE ITS LEGACY FINANCIAL AND HUMAN RESOURCE INFORMATION SYSTEM.

The City of Springfield uses a legacy financial and human resource information system developed using Unisys Mapper – a relational database. This system was developed twenty or more years ago. This software operates on a Unisys 2200 mainframe.

(8.1) The Legacy Financial System Supports the Basic Financial Needs of the City, But Should Not Be Considered a Viable Option for the Mid-Term or Long-Term.

This software and this hardware pose a number of challenges for the City of Springfield. For Unisys 2200 mainframe users, the future is uncertain due to the more arcane nature of the operating system, and the fact that both operating system and development tools have seen limited improvements in the past decade. In addition, the base of 2200 systems in use is shrinking every year. These limitations are discussed in more detail in the following paragraphs.

- **Aging Technology.** The City lacks the technology architecture required to support future enhancements in customer service. The current financial system lacks the ability to meet current functionality needs, let alone future technology goals such as realization of electronic government initiatives.
- **Mainframes are expensive machines to purchase and maintain.** This is often an order of magnitude more than similarly powered file server configurations.
- **Labor intensive, cumbersome, and confusing processes associated with the legacy system.** The accounts payable process is a good example of a labor-intensive process. As noted earlier, the Public Works Department is spending approximately \$11.25 to process each invoice. This compares to a median reported by two-thirds of companies participating in an IOMA survey of \$8.50 (although best practice companies are achieving levels of \$3 per invoice). The number of invoices processed each month – an average of 260 for each of these two clerk typists – compares to benchmarks of 1,500 per month for smaller firms using best practices. There are other examples of the labor intensive, cumbersome processes associated with the City's legacy finance and human resource information system. The staff from the Stores Program enters the purchase requisitions into the legacy finance and human resource information system, based upon written purchase requisitions generated by the staff within the divisions of the Public Works Department. The staff of the Stores Program generates written stores voucher, then the staff of the Business Office enter the information from the stores voucher into the legacy finance and human resource information system.
- **Independent Service Vendors (ISVs) are no longer developing add-on tools for the platform.** The shrinkage of the installed base reduces the incentives for the ISV's to allocate their time to the development of these add-on tools.
- **Reliance on tribal knowledge is an increasingly risky proposition for the City of Springfield.** Legacy systems must rely on a shrinking "tribe" of practitioners for operation and maintenance. The necessary skills for Unisys Mapper are not being taught anymore. As the project team understands it, Unisys no longer provides support for the financial and human resource information system developed using Unisys Mapper, and there is only one employee in the City that is familiar with the source code. This places the City at risk with the loss of this experienced programmer through retirement.
- **Lack of extendibility.** Obsolete development tools and interfaces can make legacy systems difficult to extend, integrate, and enhance. Today, systems touch all parts of the business: front office (customer service at the counter or over the phone), back office (accounts payable, payroll, accounts receivable, etc.), the web to enable employees to modify their fringe benefits without intervention by the Personnel Department, remote users such as residents paying their property taxes on-line, etc. Legacy systems can't "plug and play" to support these cross-

functional business processes.

- **Regulatory non-compliance.** Legacy systems can be difficult to change and may not respond easily to new regulations like the Sarbanes-Oxley Act and HIPAA, which require companies to store and retrieve data across all types of media (email, voicemail, documents, digitized images, etc.). Can the City accept the risk of not complying with new regulations?

While the current legacy financial system supports the basic financial needs of the City, it should not be considered a viable option for the mid-term or long-term, and it significantly impeded the ability of the City to enhance the efficiency of its core business.

(8.2) The City Will Realize A Number of Benefits From the Acquisition of a Modern Financial and Human Resource Information System.

There are a number of benefits that would accrue to the City of Springfield with the replacement of the legacy financial and human resource information system. These include such benefits as portrayed below.

- **Reengineering core business processes.** A modern financial and human resource information system can promote standardization and improvements in business processes, facilitate organization-wide management and analysis capabilities, and enhance decision-making.
- **Accessible information.** The principal benefits of modern financial and human resource information systems (e.g., security, reporting, and Internet capabilities) result from advances in information technology. Such features are designed to enable the integration of business processes and the sharing of information to achieve greater efficiencies, provide more accurate data, and enhance analysis and decision-making throughout the organization.
- **Technology Infrastructure for other information systems.** A modern financial and human resource information system will enable the City to build a technology infrastructure that is critical for supporting future additional systems and the integration of these systems. It would enable a maintenance management system used by the Public Works Department to exchange information with the financial and human resource system so that data is entered into one database and flows into other databases..
- **Information Flow and Workflow.** A single data repository ensures that accurate

information is routed to the appropriate user to initiate actions, approval processes, and decisions. Clear and effective transactional audit trails enhance data integrity, and automated workflow leads to process efficiencies and the dissemination of timely and relevant data.

- **e-Government.** Modern financial and human resource information systems offer inherent Internet and web capabilities. Cities provide the web as an information resource and a library to enable residents to find answers to their questions. The Internet and web interface provide a channel for cities to reach their potential customers. The use by residents of the City's web interface would further fuel customers' reliance on web-based access to contents and services.
- **Standardization.** Having one integrated financial and human resource information system will ensure standardized data elements for employee records, standardized reporting, and standardized business process flows across the City. It will be easier to train employees to perform transactions using a single standard system and common administrative processes. As a result, employees will have greater value and utility to the organization because they can be employed more flexibly across the City's operations.
- **Improved Ease of Use.** Modern financial and human resource information system user interfaces are significantly "friendlier," and eliminate the use of arcane keyboard codes that end-users must memorize. As a result, it is easier to train existing and new employees on systems and processes.
- **Enhance the Role of City IT Staff.** By using leading technology tools and resources and expanding access to the Modern financial and human resource information system, the City has an opportunity to enhance the role of its information technology staff as a strategic business partner/consultant for the entire City.

The benefits of replacing the legacy financial and human resource information system are significant.

(8.3) The City Should Acquire a Tier 2 Financial and Human Resource Information System.

There are two tiers of modern financial and human resource information systems. Tier 1 consists of systems offered by large, multi-national firms as Oracle and SAP. Tier 2 systems consist of systems offered by such domestic firms as Eden Systems and New World.

Tier 1 and Tier 2 systems have their own distinct advantages and disadvantages.

These advantages and disadvantages can be summarized as follows:

- Tier 1 companies offer the most advanced financial and human resource information systems, and the most expensive;
- Tier 2 firms have made their products more applicable to the public sector (e.g., fund accounting, budget checking, encumbrance accounting) so that implementation of their products does not require significant customization.; and
- Tier 2 systems offer less technologically advanced solutions than Tier 1 systems, but Tier 2 systems have been designed as public-sector solutions from the start. This means that these systems are likely to meet the essential business requirements of the City for a more reasonable cost than Tier 1 systems.

However, there is a significant difference in how well features are developed between Tier 1 and Tier 2 products. While Tier 1 solutions provide the most advanced features that can meet the City's needs, there may be limitations on the viability of some Tier 2 systems. This suggests that the City would need to be much more careful in the choice of Tier 2 systems. The project team has worked with a number of local governments in the northeast United States and elsewhere that have acquired Tier 2 systems, and have shortly thereafter regretted that decision and, in some cases, replaced that system. In other cases, the project team has worked with local governments that have acquired Tier 2 systems that have worked effectively in meeting their needs and that have provided functionality and ease of use. On the other hand, the project team is aware of one county that acquired and failed to successfully install a Tier 1 system, and a city that suffered significant problems with timely and accurate financial reporting with a Tier 1 system.

The exhibit following this page presents a summary of the distinct variations between Tier 1 and Tier 2 systems. The bottom line is that Tier 2 systems can be

referred to as “integrated financial systems for the public sector.” These are systems that have all of the basic characteristics of integrated financial and human resource systems such as workflow, integration between modules, security, flexible chart of accounts, and flexible technological architecture, but simply are not as advanced on these counts as the top Tier 1 systems. However, the Tier 1 systems have a Total Cost of Ownership that is considerably less than Tier 1 systems. These Tier 2 systems offer superior value for mid-sized governments such as the City of Springfield.

(8.4) The City Should Consider a Number of Criteria In Selecting a Tier 2 System.

There are a number of criteria that the City should consider in evaluating alternative Tier 2 systems. These criteria are presented in the following paragraphs.

- **Practicality of the software.** The evaluation of the practicality and ease of use of the Tier 2 system should include a comprehensive approach that answers the following questions:
 - Can the Tier 2 system meet the needs of the City’s core financial and human resource services or does the vendor provide a limited solution?
 - Can the Tier 2 system meet most requirements “fully-out-of-the-box,” via a reporting tool or through configuration (without changes to the underlying source code)?
 - Does the Tier 2 system facilitate compliance with the various statutory considerations faced by most organizations today (e.g., State Retirement programs, FLSA, FMLA)?
 - Is the Tier 2 system easy to use? Does it contain tools to enable new users to learn and adapt to the new system and its business processes?
- **Adherence of the technology to the City’s technology standards.** Assessing the underlying technology of Tier 2 system is essential to understanding the product’s longevity, flexibility, compatibility with the organization’s standards and future direction. This is a problem given the absence of such technology standards in the City of Springfield. Specific elements that must be examined include the various platforms and databases that are supported; the degree of database integration; the strength of system-wide features such as security, workflow, and reporting; and the extent of the product’s web-based architecture.

Comparison of Tier 1 and Tier 2 Financial and Human Resource Information Systems

| Tier 1 System | Tier 2 System |
|---|--|
| Technology | |
| <ul style="list-style-type: none"> Highly integrated At or moving rapidly towards 100% web-enabled/web-based product Possess powerful development tool sets that allow modification of the system without changing the source code. | <ul style="list-style-type: none"> Mostly integrated, but may possess subtle gaps especially between sub-ledgers (such as between fixed assets and purchasing). Client server product with web-enablement of certain modules or processes such as employee fringe benefit self-service. May be able to add some user defined fields, but no tool set. |
| Product Functionality | |
| <ul style="list-style-type: none"> Deep product functionality across core modules. May lack public sector specific features or such features may be of questionable quality. Often lack public sector specific modules (taxes, permitting, etc.) | <ul style="list-style-type: none"> May only provide shallow functionality across core modules. Built for the public sector from the ground up. Often have public sector specific modules such as taxes and permitting. |
| Business Partnering | |
| <ul style="list-style-type: none"> Have some alliances, but largely attempt to offer most functionality in-house. Makes extensive use of implementation partners to install software. | <ul style="list-style-type: none"> Makes more extensive use of alliances to provide functionality, especially functionality not directly related to transaction processing (such as reports). Makes little or no use of implementation partners to install software does work using own in-house consulting resources. |
| Total Cost of Ownership | |
| <ul style="list-style-type: none"> Much higher than Tier 2 systems. Implementation costs are many times that of the software. Specialized internal skills are often needed to maintain the system. | <ul style="list-style-type: none"> Much lower cost than Tier 1. Implementation costs (staff and implementation consulting assistance) are rarely more than 2x software cost. Specialized application administration skills not needed or are easily learned. |
| Implementation | |
| <ul style="list-style-type: none"> Usually requires the full-time commitment of a number of City information technology and departmental staff Often associated with 'business process reengineering.' | <ul style="list-style-type: none"> Because the software is less complex, implementation usually requires only part-time staff resources. Associated with business process automation. Software for some of the more limited Tier 2 products may not be flexible enough to enable true reengineering. |

| Software Features | |
|---|--|
| <ul style="list-style-type: none">• Graphical user interface, customizable menu structures, customizable on-line documentation• Drill down ability prevalent• Can support a number of non-conventional input options such as touch screen, IVR, bar codes, wireless access.• Powerful workflow engines that work across many, if not most, processes.• Custom reporting difficult. May be due in part to complexity of underlying tables. | <ul style="list-style-type: none">• Graphic user interface somewhat customizable, on-line help often not customizable.• Drill down ability prevalent.• Limited support for non-conventional input options.• Workflow ability limited to certain processes such as purchasing.• Custom reporting fairly simple due to simplicity of underlying tables and use of best of breed reporting tools such as Crystal Decisions. |

- **Leadership of the Tier 2 system vendor in the field.** Given that the local governments are dynamic and continue to evolve, the Tier 2 system must demonstrate that it is prepared not only to adapt to changing circumstances, but more importantly, that the vendor for that Tier 2 system has displayed leadership and vision in the field. If a vendor lacks a proven track record in the public sector it may represent an important consideration for the future.
- **Significant installed base.** Even though integrated financial and human resource systems is a relatively new concept for local governments, a vendor with a significant installed base provides the City of Springfield with multiple advantages. A Tier 2 system vendor with a large installed base provides a forum in which cities can confer and exchange ideas. In addition, a large installed base of local governments indicates that the software can meet the diverse functional and technological needs of the sector.
- **Vendor financial strength.** Given the sizeable investment associated with a new Tier 2 system, an analysis of the overall strength of the vendor is an important element of assessing the viability and longevity of the product. Factors to consider in evaluating vendor strength include market share, recent increases in new customers, a particular focus on local governments, revenues/sales and net income, and budget devoted to research and development.
- **Reliance on third-party products.** Are third-party products required for essential core functions such as project accounting or fixed assets or are these elements that are built into the Tier 2 system? To what degree can third-party products be integrated to enhance the functionality of the system such as Crystal Decisions?
- **Successful implementation and customer satisfaction.** Has the proposed software been successfully implemented in similar cities as Springfield? How do customers rate the overall quality of the software with regard to its functional and technical features?
- **Assets of the vendor to assist the City in implementation.** Does the proposed Tier 2 system vendor have significant experience implementing the software in the cities? Does the vendor have a deep “bench” of implementation consultants, ensuring that they can adequately staff their implementation projects? How do customers rate the overall quality of the vendor’s implementation consulting staff?
- **Total cost of ownership.** While the estimation of the initial cost of a new Tier 2 system is easy, identifying the ongoing total cost of ownership must consider the costs that will be incurred after the initial acquisition and implementation. These costs include such items as hardware, ongoing maintenance and support, additional staff that may be required to maintain the system, continuous software training for staff, and implementation consulting services for future upgrades and troubleshooting. There are three key areas that should be considered by the City in evaluating the cost of ownership.

- Minimize modifications. The project team strongly recommends that the City minimize modifications to the Tier 2 system software whenever possible during Tier 2-system implementation. This will reduce ongoing maintenance costs and in facilitating upgrades.
- Position for and move to self-sufficiency. The project team recommends that a critical success factor for the City is self-sufficiency. Post go-live, a key measure of success should be the City's ability to rely on its information technology staff as much as possible for support.
- Leverage the City's investment in the Tier 2 system. A key advantage to acquiring an integrated financial and human resource system is the efficiencies that can be gained from reengineering core business processes.

The identification of the selection criteria is an essential element in the development of the Request for Proposal.

(8.5) The City Should Utilize a Phase-In Approach to Implementation.

Many cities have unwisely chosen concurrent implementation of all modules at the same time. There is significant risk to this approach. This approach has several disadvantages including the need to cope immediately with changes associated with the system across all organizational boundaries, the need to allocate significant levels of staff to implementation, the creation of the temptation to cut corners to meet deadlines, and the need to make complex decisions regarding multiple core business processes promptly while at the same time addressing the complexities associated with implementation of the system.

The project team recommends that the City phase-in the implementation of the financial and human resource information system. This approach would begin by installing closely related sets of modules such as general ledger, accounts payable, and purchasing. After the foundation of the initial installation is accomplished and stable,

similar phases of modular implementation should be utilized. The project team recommends that the City first implement core financials, then human resources and payroll, then followed by other financials such as budget preparation, inventory, etc. This approach provides a more manageable scope and the opportunity for quick wins. The disadvantage of this approach is the need for interim interfaces between the new and existing applications.

In addition, the project team would recommend that the go-live data for the new system coincide with the beginning of the new fiscal year, and the City not attempt a mid-year implementation.

(8.6) Acquisition of a New Financial and Human Resource Information System Would Cost an Estimated \$400,000 in Capital Outlay.

The estimated capital outlay for replacement of the new financial and human resource information system would approximate \$400,000. This would include modules for the financial system (general ledger, accounts payable, accounts receivable, budgeting, purchasing, fixed assets, project accounting, and cashiering) and human resources (payroll and human resources). It also includes training and installation assistance, conversion of the core financial and human resource data from the legacy financial and human resources information system, and a Web-enabled capacity that includes an e-commerce capacity. The ongoing licensing fees for the system would approximate \$100,000 annually.

Recommendation: The City should replace its legacy financial and human resource financial system.

3. PLAN OF ORGANIZATION

3. PLAN OF ORGANIZATION

This section of the report analyzes the plan of organization for the Public Works Department. To evaluate the plan of organization, the project team conducted the following analytical tasks:

- Determined the specific responsibilities of each managerial and supervisory position within the department and in related functions outside the department, and evaluated each in the context of assigned responsibilities and organization;
- Evaluated the extent to which the organizational structure of the department and the services it delivers are organized around the clients it serves and the competencies of its staff;
- Reviewed the number of managerial and supervisory layers within the department and opportunities to flatten the organization; and
- Appraised the extent of administrative support and overhead costs within the department.

The first section describes the organizational principles utilized in this analysis.

1. THE CURRENT PLAN OF ORGANIZATION IMPEDES EFFECTIVE SERVICE DELIVERY AND MANAGEMENT ACCOUNTABILITY.

Well-managed organizations are designed to deliver services to customers and to maximize management control over service delivery. Several measures can be utilized to evaluate the effectiveness of an organizational structure in meeting these objectives. The project team evaluated the organization of the Public Works Department on the following factors:

- **The Public Works Department is organized on a ‘form follows function’ basis** with a clear, distinct and comprehensive sense of purpose or mission for each functional area. Functions are grouped consistent with their periodic interaction, common planning and scheduling systems, delivery of services which are linked in some way, etc. resulting in functional cohesion.
- **The organizational structure fosters accountability.** The organizational structure fosters accountability among management and supervisory staff. While

this criteria overlaps with the management systems utilized, the organizational structure itself can facilitate or impede the performance of an organization.

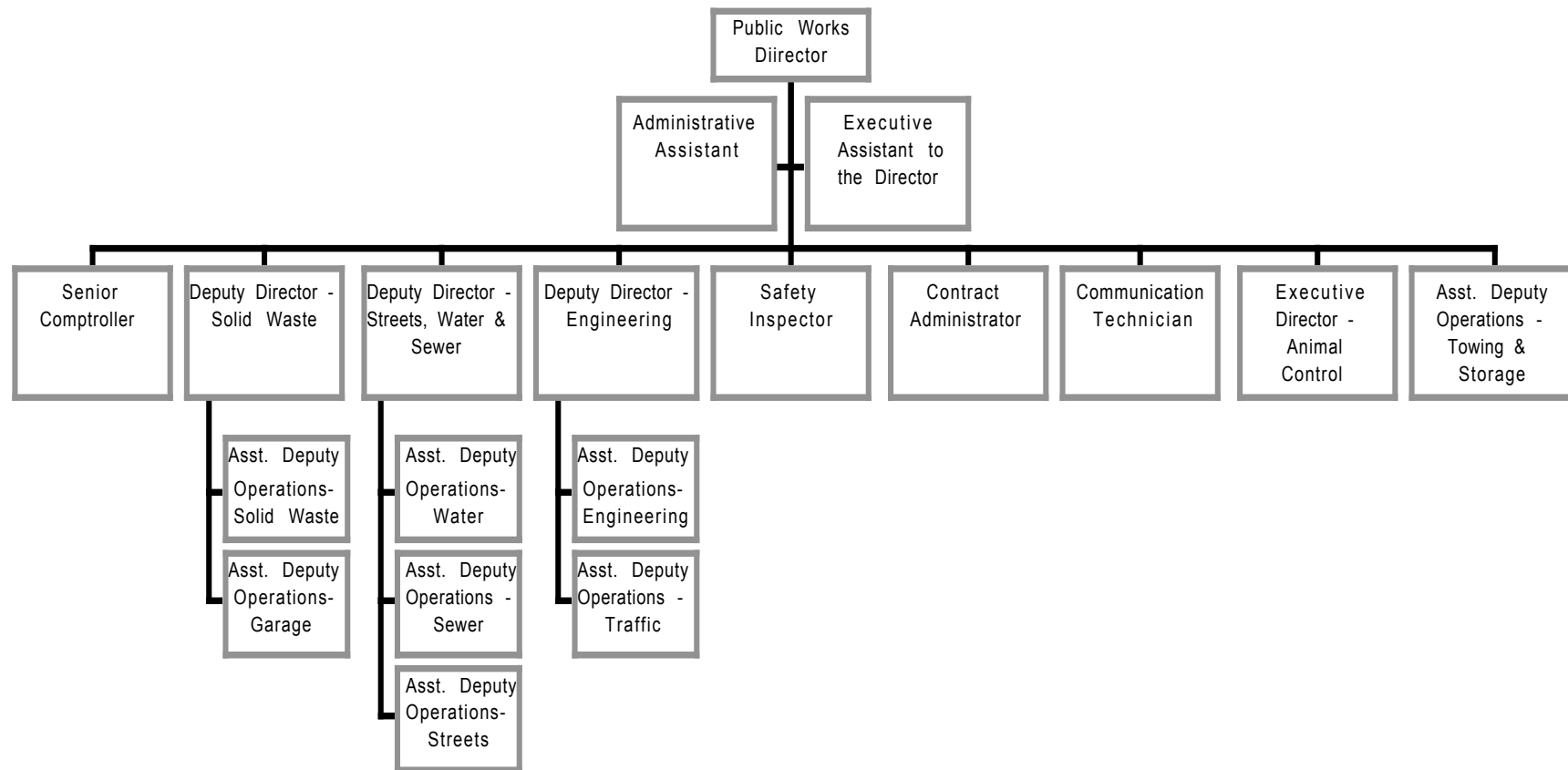
- **The plan of organization enhances communication and coordination.** The number of handoffs/exchanges required among different departments providing service to the public is minimized. The structure enhances shared knowledge and understanding among divisions and departments. The channels of communication are clear and consistent.
- **Staff resources are utilized efficiently.** The plan of organization minimizes administrative overhead. Workload can be distributed/shared to maximize the productivity of staff through peaks and valleys and offer cross-functional capabilities (e.g., to balance workload of maintenance staff across street maintenance, traffic control maintenance, etc.). Processes can be standardized to enhance the efficiency and customer responsiveness of services (e.g., the development review process).
- **The potential of human capital is enabled.** The plan of organization enhances career development opportunities, training and recruitment and retention.
- **The quality and responsiveness of services provided to customers is improved.** The plan of organization enables staff to provide better service to the public in terms of cycle times, user friendliness, performance management, quality control, and consistency of the application of policies and procedures. Customers are the hub – with the Public Works Department organization designed around them.
- **Each division in the Public Works Department has been placed at a level in accordance with its importance in achieving department-wide goals.** Divisions have not been placed too high in the organizational structure or too low relative to their importance.
- **The span of control for any manager or supervisor does not exceed the number which can be feasibly and effectively supervised.** The trend is to widen span of control. In the last decade, the introduction of information technology spurred the trend toward wider spans of control.
- **The number of layers of management does not result in a tall, narrow configuration for the department.** Organizations with many layers are associated with centralized decision-making. Flatter organizations tend to have decentralized decision-making, as authority for making decisions is given to the front line employees.
- **The plan of organization enhances the effectiveness of the Public Works Department as the chief executive officer of a corporation with annual expenditures of \$15 million.** The organizational structure limits the span of

control of the Public Works Director, and provides analytical support to develop goals, objectives, and performance measures.

The current administrative plan of organization is presented in the exhibit following this page. The paragraphs below provide an evaluation of the organizational structure of the department.

- **The Thomas J. O'Connor Animal Control Center is assigned to the Public Works Department.** There is little correlation between the mission of the Public Works Department and the mission of the Thomas J. O'Connor Animal Control Center. It is more the norm for animal control services to be placed in a Police Department given the enforcement aspects of animal control or a Health Department given the health-related aspects of animal control.
- **The Safety Inspector is not utilized effectively for the employee safety program.** The Safety Inspector is utilized as an administrative officer with responsibilities for supervision of the Clean Cities Program and the Customer Service Center.
- **There are a number of functions that have not been placed at a reporting level in accordance with their importance in achieving department-wide goals.** The Contract Administrator reports to the Public Works Director. The Communication technician reports to the Public Works Director. The Assistant Deputy Director for Towing and Storage reports to the Public Works Director. The Assistant Deputy Director for the Garage reports to the Deputy Director – Solid Waste.
- **The spans of control for Deputy Directors are narrow.** More specifically:
 - The Deputy Director for Solid Waste supervises the Assistant Deputy - Operations for Solid Waste, and the Assistant Deputy - Operations for the Garage;
 - The Deputy Director for Streets, Water and Sewer supervises the Assistant Deputy - Operations for Streets, the Assistant Deputy - Operations for Water, and the Assistant Deputy - Operations for Sewer; and
 - The Deputy Director for Engineering and Traffic supervises the Assistant Deputy - Operations for Engineering and the Assistant Deputy - Operations for Traffic.
- **The spans of control for the Assistant Deputy - Operations are narrow.** More specifically:

Current Plan of Organization of the Public Works Department



- The Assistant Deputy - Operations for Engineering supervises a Senior Civil Engineer and clerical support staff;
 - The Assistant Deputy - Operations for Traffic supervises a Traffic Engineering Foreman, a Principal Traffic Engineer and a Junior Civil Engineer (the last two positions are vacant);
 - The Assistant Deputy - Operations for the Garage supervises two Garage Foremen;
 - The Assistant Deputy - Operations for Solid Waste supervises three Streets and Engineering Foremen and a Skilled Laborer/MEO/HMEO that functions as the “acting” foreman at the landfill;
 - The Assistant Deputy - Operations for Water supervises four foremen;
 - The Assistant Deputy - Operations for Streets supervises three foreman; and
 - The Assistant Deputy - Operations for Sewer supervises three foremen.
- **The Executive Assistant to the Public Works Director has been reassigned as the “acting” Director of Facilities Management.** This has removed an essential resource for the Public Works Director. This position was utilized to address key management problems within the department. There are a number of management problems that have not been addressed as a result of the absence of the incumbent such as the Stores Program.
 - **The storekeepers for the Garage report to the Stores Control Supervisor for the Stores Program, and not the Assistant Deputy Director for the Garage.** It is difficult to hold the Assistant Deputy Director for the Garage for the level of service delivered by the Garage when the Assistant Deputy does not have control over a key resource that impacts turnaround time for equipment repairs. Parts and parts availability can be a significant obstacle in the timely completion of repairs.
 - **The supervisory and management structure for Engineering is too flat. There is one Senior Civil Engineer.** All of the other professional-level engineers are Assistant Civil Engineers or Junior Civil Engineers. Opportunities for career progression are limited given this structure, and the ability of the Senior Civil Engineer to supervise all of the staff in Engineering, particularly with the addition of the Conservation Commission, is limited with the existing structure.
 - **Responsibility for maintenance and repair of streets and related assets have been fragmented.** An Assistant Deputy – Operations is responsible for managing streets maintenance including pavement maintenance, street

sweeping, and sidewalks. Another Assistant Deputy – Operations is responsible for street sign and traffic signal maintenance.

- **The Public Works Department has its own building maintenance staff.** This position is the Director of Maintenance and Operations, budgeted in the Streets Division. Yet the Facilities Management Department is responsible for the maintenance and repair of all City buildings.

The organizational analysis of the Public Works Department indicates that changes are necessary in order to create a more functionally efficient and effective organization and to hold management accountable for the delivery of services.

2. THE PLAN OF ORGANIZATION FOR THE PUBLIC WORKS DEPARTMENT SHOULD BE MODIFIED.

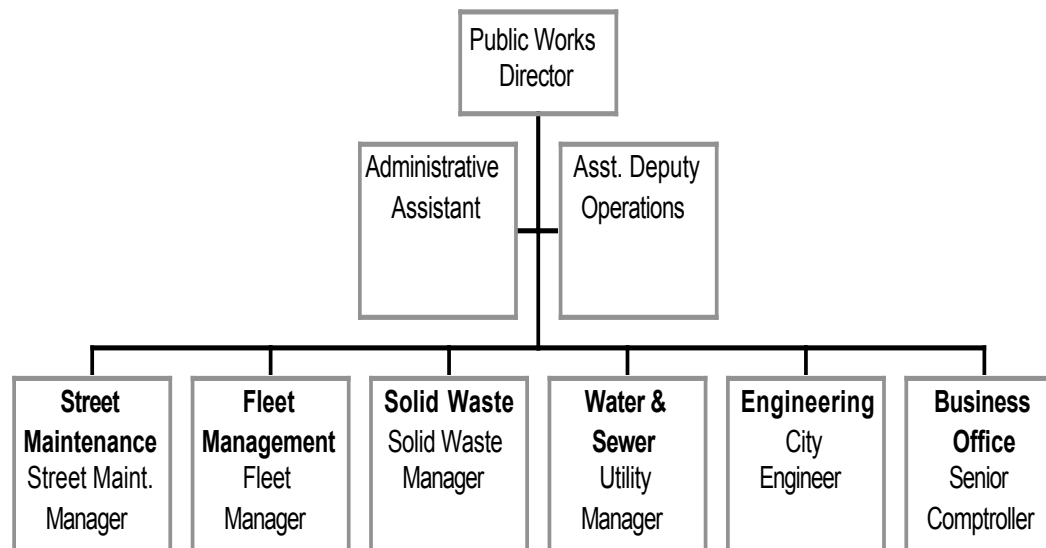
The specific objectives of this proposed plan of organization are as follows:

- Further the mission of the Public Works Department to be a world-class organization dedicated to the preservation of the City's infrastructure and environment;
- Integrate and add value to capital project management services, and actively coordinate and collaborate with other departments in the management of the City's capital improvement plan;
- Elevate key infrastructure management programs to a level in which these programs report directly to the Public Works Director;
- Insure fiscal responsibility and accountability;
- Focus core service delivery within the Public Works Department on those services essential to the department's mission; and
- Reduce administrative overhead costs and reinvest in direct service.

The plan of organization is presented on the following page. Important points to note concerning the proposed plan of organization are presented below.

- **Two management layers would be consolidated into a single layer.** The layer represented by the Deputy Director positions and the layer represented by the Assistant Deputy Operations would be consolidated with fewer managerial positions as a result. At present there are nine filled positions and two vacant positions (as of April 12, 2005) excluding the Senior Comptroller. Five fewer

Proposed Plan of organization for the Public Works Department



positions would be needed under the proposed plan of organization.

- **Division head positions would be established for the core programs within the Public Works Department including Solid Waste, Fleet (Garage), Streets, Water and Sewer Utilities, Engineering, and Administration.** Each of those division heads would report directly to the Public Works Director. This would result in five division heads, responsible for infrastructure management, reporting to the Public Works Director. In addition, the Senior Comptroller would continue as a division-head for the business office.
- **The Senior Comptroller would continue to manage the Business Office.** This manager functions as the chief financial officer for the Public Works Department. Given the complexity of the legacy finance and human resource information system, this managerial position is essential in managing the day-to-day financial operations of the Public Works Department.
- **The Executive Assistant to the Director position would be eliminated, and the Assistant Deputy – Operations for Towing and Storage reallocated to provide this support for the Public Works Director.** There are a number of challenges that the department faces in areas such as goals, objectives, and performance measures, the installation of an automated maintenance management system, the improvement of security and internal controls in the Stores Program, etc. The Assistant Deputy – Operations should assume responsibility for the supervision of the Communication Technician, the Customer Service Center, and the Clean Cities Program.
- **The Safety Inspector should be transferred to the Personnel Department.** This resource should be utilized as a citywide resource to address employee safety and health. The position should not be hindered by the inevitable conflicts of interest that arise when the department in which this position is located is also the department that the Safety Inspector is citing for safety violations.
- **The Director of Maintenance and Operations should be transferred to the Facilities Management Department.** The Facilities Management Department should assume responsibility for the maintenance and repair of the Public Works Department building at 70 Tapley Street.
- **The storekeeper positions assigned to the Garage should be assigned to the Garage and placed under the supervision of the Assistant Deputy – Operations for the Garage.** These positions primary purpose is to obtain and dispense parts for the technicians assigned to maintenance and repair of light, medium, and heavy equipment. These positions should not be located in the Stores Program, and should not be supervised by the Stores Control Supervisor. This issue will be addressed in more detail in the chapter regarding Administration and in the chapter regarding the Garage.

- **The responsibility for the supervision of staff assigned to sign and traffic signal maintenance should be assigned to the Assistant Deputy – Operations for Streets, and the Assistant Deputy – Operations for traffic position eliminated.** The Assistant Deputy – Operations for Streets supervises three foremen at present. The reassignment of staff assigned to sign and traffic signal maintenance to this manager would expand his span of control to four. This manager should be held accountable for the preventive maintenance and repair of the City's street system including signs, striping, pavement legends, and traffic signals. This issue will be addressed in more detail in the chapter regarding Streets. This would enable the elimination of the position of Assistant Deputy – Operations for Traffic; this position only supervises one filled position at this time – a Traffic Foreman.
- **The responsibility for supervision of the Thomas J. O'Connor Animal Control Center should be assigned to the Health and Human Services Department.** There are a number of connections in terms of the services delivered by the Animal Control Center and those of Health and Human Services such as rabies control, dog bite investigations, pet licensing, spaying and neutering of pets to prevent pet overpopulation, etc.
- **The plan of organization for Engineering should be modified.** This proposed plan of organization should reduce the span of control for the Senior Civil Engineer, provide logical career progression, and organize Engineering into logical groups such as design, construction management, etc. This issue will be addressed in the chapter regarding Engineering and Traffic.

The goal of this proposed plan of organization is to reduce the number of layers, to focus the department on its core mission, to improve the accessibility of key programs such as the Garage to the Public Works Director, and to strengthen the extent of engineering expertise within the department.

Recommendation: The plan of organization of the Public Works Department should be modified.

4. ADMINISTRATION

4. ADMINISTRATION

This chapter presents an analysis of the Administration Division. The Administration Division is composed of a number of sections that support other divisions within the department. These sections include the Business Office, Information Technology, Clean Cities, Customer Service Center, and Contract Administration. The Business Office is responsible for departmental payroll, accounts payable, accounts receivable, and departmental reception. Information Technology is responsible for providing technical support to the divisions in support of existing hardware and software and the installation of new and replacement hardware and software. Clean Cities is responsible for collection of illegal dumping. The Contract Administration program is responsible for assisting the divisions in the bid and award of contracts.

1. A NUMBER OF OPPORTUNITIES FOR IMPROVEMENT NEED TO BE ADDRESSED WITHIN THE STORES PROGRAM.

The Store Section provides two different stores for the Public Works Department including a (1) a central stores utilized by Streets, Water and Sewer, and (2) a parts room for the Garage. Eleven staff are authorized for the Stores program; all of these staff are budgeted in the Garage Division with the exception of a Laborer budgeted in Water and Sewer. These eleven staff, and their roles, are presented below.

- Stores Control Supervisor. This position is responsible for supervising the operations of the Store Section, and ordering materials and supplies.
- Two staff – a Senior Storekeeper and a Storekeeper - are assigned to the Garage: one for the day shift and another for the swing shift.
- A Storekeeper is assigned to the dispensing of material for Water and Sewer.

- A Storekeeper enters purchase requisitions into MAPPER for all of the divisions in the Public Works Department, and prepares written store vouchers for items withdrawn from the Stores.
- A Construction Handyman picks up and delivers mail for the Public Works Department.
- A Senior Storekeeper and a Principal Storekeeper position were vacant at the time of this analysis.
- A Skilled Laborer is assigned to the operation of the forklift to load and unload trucks with materials and supplies.
- A Skilled Laborer is assigned to “chasing” parts for the Garage.
- A Laborer, although budgeted in the Water and Sewer Division, loads and unloads trucks of materials and supplies, stocks the shelves, and also “chases” parts.

The total value of the materials and supplies within the Stores as of March 22, 2005, amounted to \$852,021 excluding fuel. Of the materials and supplies in the Stores:

- 79.2% or \$674,706 are allocated for the water and sewer utilities;
- 17.8% or \$152,140 are allocated for Streets; and
- 3% or \$25,173 are allocated to the Garage.

The Stores Section is operated as a revolving fund. For fiscal year 2003-04, the Stores Section dispensed \$987,340 in materials and supplies; in the first eight months of fiscal year 2004-05, the Stores Section dispensed \$779,431 in materials and supplies.

There are a number of opportunities to improve the cost effective operations of the Stores Section. The Public Works Director and the Senior Comptroller have been aware of these opportunities and have recently conducted a number of meetings to discuss these opportunities.

The opportunities recommended by the project team to improve the cost effective operations of the Stores Section are presented below.

(1.1) The Senior Comptroller in the Public Works Department Should Reconcile the Inventory Audit to the Inventory Information in the Legacy Finance and Human Resource Information System Within Thirty Calendar Days of the Completion of the Audit.

The inventory of materials and supplies has not been reconciled to the inventory audit conducted by the City Auditor for at least three years. The result is that the inventory in the legacy finance and human resource information system does not reflect the inventory on the shelves of the Stores.

Recommendation: The Senior Comptroller in the Public Works Department should reconcile the inventory audits in the future within thirty calendar days of the completion of the audit.

(1.2) The Stores Section Should Provide Security For the Materials and Supplies in the Stores.

The project team walked through the stores on a number of different occasions. The lack of security was clearly evident.

- **The Stores Section Should Conduct Spot Audits of Materials and Supplies in the Stores On A Routine Weekly Basis and Reconcile the Results of the Spot Audit to the Legacy Finance and Human Resource Information System.** Routine inventory monitoring processes provide some security. If the Stores Section knows what inventory it has and what it is supposed to have at any given point based upon the legacy finance and human resource information system, identifying a source of theft is much easier. If it goes on for weeks or months before the Stores Section knows about it, the damage has already been done and the Stores Section probably won't recoup its losses. It's best to check early - on a weekly basis - and often. The Stores Control Supervisor should report the results of the spot audits to the Senior Comptroller.
- **The Security of Materials and Supplies Needs To Be Considerably Enhanced.** It is a relatively simple matter to take a part out of the Stores and walk out a side entrance. There isn't any fencing or controls over the exit to prevent that. In addition, staff assigned to programs other than Stores work in the same area as Stores with unfettered access to the material and supplies within the Stores. The Public Works Department should enhance the security of these materials by the following measures:
 - The Public Works Department should place all of its materials and supplies in the Stores behind wire mesh partitions. This should include

locked wire mesh doors.

- In addition, the Stores has far too many doors providing access to the materials and supplies. There should only be one that is open, and there should be an employee capable of watching this door. If fire regulations require more than one door, the Stores should use bars that set off an alarm if the doors are opened. The main entryway to the Stores should be secured by electronic access controls.
- The entry into the restricted space – the materials and supplies in the behind wire mesh partitions – should be stringently controlled and limited. Only individuals assigned to Stores should be able to access these areas and obtain materials and supplies. Security measures for this restricted space should include electronic access control.

There are clearly a number of basic measures that the Public Works Department should take to improve the security of the Stores.

Recommendation: The Stores Section should conduct weekly spot audits of the materials and supplies on hand weekly and reconcile the results to the legacy finance and human resource information system.

Recommendation: The Stores Section should provide security for the materials and supplies in the Stores.

(1.3) The Stores Section Should Reduce Its Inventory and Increase the Number of Inventory Turns Per Year.

The total value of the materials and supplies within the Stores as of March 22, 2005, amounted to \$852,021 excluding fuel. For fiscal year 2003-04, the Stores Section dispensed \$987,340 in materials and supplies; in the first eight months of fiscal year 2004-05, the Stores Section dispensed \$779,431 in materials and supplies.

This amount of materials and supplies dispensed indicates that the Stores Section is achieving between 1.2 to 1.4 inventory turns annually.

Inventory turns are a measure of how quickly a company replenishes its entire stock of materials and supplies annually. The more turnovers there are, the less time inventory sits idle, which helps improve cash flow. The average number of inventory

turns varies greatly by industry and by companies within industry segments. U.S. companies have dramatically improved their inventory turns during the past few years. Inventory in businesses in this country approximate an average of 5.4 annual turns. The increasing emphasis on a fully integrated supply chain with vendors providing inventory just-in-time means that inventory spends less time on the shelf.

The Public Works Department should adopt an objective for its Stores Section achieving an annual inventory turn rate of 5 to 6. This suggests that the value of the inventory on hand is excessive given the current inventory turn rate of 1.2 to 1.4 times annually. The Public Works Department should analyze its inventory with a goal of reducing the amount of inventory to a range approximating \$170,000 to \$210,000. This effort should include the setting of minimum and maximum stocking levels for each of the items in the stores based upon the goal of five to six turns annually.

Recommendation: The value of the inventory in the Stores should be reduced from its current value of \$850,000 to \$170,000 to \$210,000.

Recommendation: The Stores Section should set and meet an objective of five to six inventory turns annually.

(1.4) The Three Stores Section Positions Allocated to the Garage Should Be Placed Under the Supervision of the Assistant Deputy for Operations Although One of the Three Positions Should Be Eliminated.

There are currently three positions authorized within the Stores Section for the Garage. This includes the following:

- Two staff – a Senior Storekeeper and a Storekeeper - are assigned to the Garage: one for the day shift and another for the swing shift.
- A Skilled Laborer is assigned to “chasing” parts for the Garage.

The project team uses a benchmark of one storekeeper position for every ten equipment maintenance and repair technicians. The Garage Division is authorized the

following number of positions:

- 9 Motor Equipment Repairman;
- 5 Senior Motor Equipment Repairman; and
- 3 Master Mechanics.

This is a total of 17 maintenance and repair technicians. This staff works two shifts: day and swing Monday through Friday. With the benchmark of one storekeeper position for each ten equipment maintenance and repair technicians, the Skilled Laborer position should be eliminated. This would leave two positions, one for each shift, to provide storekeeper support for the Garage Division.

The two other positions – the Senior Storekeeper and Storekeeper – should be placed under the supervision of the Assistant Deputy Director for the Garage Division. This is essential to holding this manager accountable for the level service for fleet management.

Recommendation: The Skilled Laborer position assigned to “chasing” parts for the Garage should be eliminated.

Recommendation: The Senior Storekeeper and Storekeeper positions assigned to the support of the Garage Division should be placed under the supervision of the Assistant Deputy Director for the Garage Division.

(1.5) The Water and Sewer Commission Should Reimburse The City For \$340,000 in Materials and Supplies in the Stores.

The total value of the materials and supplies within the Stores as of March 22, 2005, amounted to \$852,021 excluding fuel. Of the materials and supplies in the Stores program, 79.2% or \$674,706 is allocated for the water and sewer utilities. The Water and Sewer Commission only reimburses the City after the materials and supplies are dispensed from Stores and actually utilized, although the Water and Sewer Commission

does maintain an appropriation of \$335,000 in the working capital revolving fund for the Stores.

The amount of inventory in the Stores for the water and sewer utilities – as of March 22, 2005, amounted to \$674,706. This is almost \$340,000 more than the standing appropriation maintained by the Water and Sewer Commission.

Recommendation: The Water and Sewer Commission should reimburse the City for the \$340,000 in materials and supplies maintained in the Stores for the water and sewer utilities.

(1.6) The Working Capital Revolving Fund For the Stores Should Be Eliminated.

The Stores should not be funded on a revolving fund basis. The Stores should acquire materials and supplies for the various divisions and immediately allocate these costs to these divisions. This includes the allocation of materials and supplies to the Water and Sewer Commission.

Recommendation: The Stores should not be funded as a working capital fund, but should charge the divisions and the Water and Sewer Commission for any materials and supplies it purchases for these customers.

(1.7) Four Staff Should Be Allocated to the Operation of the Stores.

At present, there are eleven staff allocated to the Stores Section. As recommended previously, three Stores Section staff assigned to the support of the Garage Division should be reassigned to the Garage Division.

There are a number of measures that suggest that the level of staffing for the Stores Program can be reduced.

- The project team has used a metric of \$250,000 to \$300,000 in “sales” in a small to medium public works-type warehouse per authorized position. This would require the equivalent of 3.9 to 4.7 staff.
- In the three months from July through September 2004, the staff assigned to the Stores Program processed 1,511 Stores Vouchers. On average, that

approximates 25 Stores Vouchers a day or approximately 3 an hour for an eight-hour workday.

- Several of these staff are on modified duty. This includes the Laborer and the Skilled Laborer.
- Other positions are vacant including a Storekeeper and Senior Storekeeper.

The project team recommends that the Stores Section be allocated four staff.

These four staff would include the following:

- Stores Control Supervisor. This position is responsible for supervising the operations of the Store program and ordering materials and supplies.
- Two Storekeepers are assigned to the dispensing of materials and supplies from the Stores, and preparation of written store vouchers for items withdrawn from the Stores.
- A Construction Handyman picks up and delivers mail for the Public Works Department, and would pick up materials and supplies as necessary.

Personnel available from the Department of Transitional Assistance should supplement these four staff by providing assistance while the Stores Section staff load and unload trucks.

Recommendation: Four staff should be allocated to the Stores Section.

Recommendation: Four positions assigned to the Stores Section, two of which are vacant at the present time, should be eliminated. These four positions include a Storekeeper, Senior Storekeeper, a Skilled Laborer, and Laborer.

2. THE CLEAN CITIES SECTION SHOULD ADDRESS A NUMBER OF OPPORTUNITIES FOR IMPROVEMENT.

The Clean Cities Section is responsible for (1) cleaning and maintaining CDBG properties for Community Development-Housing; (2) cleaning up illegal dumping in other areas of the City; and (3) cleaning up properties on behalf of Code Enforcement as a result of court orders. This section is authorized eight staff. This staff includes:

- A Working Foremen Skilled Laborer who is responsible for administration of the

program with the position largely based at the offices of the Public Works Department at 70 Tapley Street;

- A Working Foreman Building Maintenance Man who is responsible for field supervision of the staff assigned to the program;
- A Skilled Laborer who is responsible as a lead worker;
- Three Building Maintenance Man and a Construction Handyman who are responsible for the removing of the illegal dumped materials; and
- A Senior Customer Service Representative who is responsible for inspection of the 163 properties that are cleaned up by this program, assessment of the condition of the property including taking digital photographs, the condition of the housing, if any, and prioritization of the cleanup of these properties.

This staff is supplemented with 30 persons assigned by the Massachusetts Department of Transitional Assistance (DTA) on a rotating basis. The hours of these 30 DTA persons range from 20 to 30 hours per week.

For the fiscal year July 2003 to June 2004, the Clean Cities Section accomplished the following:

- Code Enforcement - cleaned 73 lots collecting 141.57 tons of debris, and boarded up 16 locations;
- Community Development - Housing – Cleaned 62 lots including cutting weeds collecting 67.17 tons of debris and boarded up 14 locations; and
- Cleaned 69 lots in other locations of the City collecting 73.07 tons of debris and boarded up 2 locations.

The staff assigned to this section also provides snow and ice control services at Community Development – Housing properties.

The opportunities recommended by the project team to improve the cost effective operations of the Clean Cities Section are presented below.

(2.1) The Clean Cities Section Should Enhance Enforcement Efforts At Sites With Frequent Illegal Dumping To Detect and Apprehend Violators.

The Clean Cities Section plans on using video cameras to provide surveillance at sites with frequent illegal dumping. The City of Worcester has utilized this surveillance approach and apprehended offenders as a result. The City plans on playing the tape of these offenders on its local government cable television channel. This is one of a series of tools that the Public Works Department should utilize.

One city was able to reduce illegal dumping by 95% with a range of enforcement approaches including the following:

- Undercover surveillance – Posing as an unlicensed caller or dressing as a homeless vagrant, the enforcement officer made 122 arrests of unlicensed haulers and other violators caught dumping;
- Fines – The City required people to pay a \$500 fine if their garbage is illegally dumped, whether the generator dumped the garbage or an unlicensed hauler hired by the generator. One City adopted an ordinance with progressive penalties for dumping offenders to include a first-degree misdemeanor as opposed to littering offenses. This increased the maximum penalty for illegal dumping from 60 days in jail and a \$500 fine to six months in jail and a \$1,000 fine. In addition, judges have the discretion to sentence offenders to either clean up or pay the costs of cleaning up their discarded debris.
- Sting operations – Implement a sting operation to catch unlicensed haulers by posing as customers needing collection services.
- Rewards – One City offers residents rewards for turning in illegal dumpers. This should include asking neighbors of locations of frequent illegal dumping to get the license plate number of violators.
- Video cameras – The City of Worcester has successfully utilized video cameras to apprehend haulers that dumped material illegally. One agency actually posted signs that cameras were observing the site and placed fake cameras.
- Post signs at sites that are frequently the location of illegal dumping notifying violators of the illegal dumping fine.
- Hot Line – The City should create a hot line to call and report illegal dumping.

Recommendation: The Public Works Department should enhance enforcement efforts to detect illegal dumping and apprehend violators.

(2.2) The Public Works Department Should Work With Community Development-Housing To Demolish Abandoned Houses That Are The target of Illegal Dumping.

The Working Foremen Skilled Laborer for the Clean Cities Section estimated that 90% of the problem with illegal dumping is eliminated once the abandoned house is demolished.

Rather than continuing to react to illegal dumping at these abandoned houses, the Public Works Department should work with Community Development-Housing to demolish those abandoned houses that are frequent targets of illegal dumping.

Recommendation: The Public Works Department should work with Community Development-Housing to identify those abandoned houses that are frequent targets of illegal dumping and develop a plan using Community Development Block Grant funds to demolish these abandoned houses.

(2.3) The Level of Staffing for the Clean Cities Section Should Be Reduced By Two Positions.

The Clean Cities Section is important asset to the City of Springfield in addressing the improvement of the City's neighborhoods. The Section has made an innovative use of the Massachusetts Department of Transitional Assistance (DTA) to supplement the efforts of the department's staff. In addition, the Community Development-Housing pays the salaries of the three Building Maintenance Man and a Construction Handyman even though the tonnage collected from Community Development Block Grant properties amounts to 24% of the tonnage collected by the Clean Cities Program. The Clean Cities Section has developed cost-effective practices to address illegal dumping in the City.

The project team recommends that two positions be eliminated to further

enhance its cost-effectiveness.

- **The Senior Customer Services Representative position should be eliminated.** The Working Foremen Skilled Laborer should be responsible for responsible for inspection of the 163 properties that are cleaned up by this program, assessment of the condition of the property including taking digital photographs, the condition of the housing, if any, and prioritization of the cleanup of these properties. Since the Working Foremen Skilled Laborer does not provide field supervision, the Working Foremen Skilled Laborer should have sufficient time to inspect these properties and prioritize the cleanup.
- **The Construction Handyman position should be eliminated.** The Program uses persons from the Massachusetts Department of Transitional Assistance (DTA) to supplement the efforts of the Clean Cities Program staff. Approximately 30 persons are allocated by the DTA to the Clean Cities Program with the hours of these 30 DTA persons ranging from 20 to 30 hours per week. The Public Works Department should continue to rely on DTA for an important source of the labor needed to clean up illegal dumping.

The Clean Cities Section would continue to function with six positions, supplemented by persons from DTA. This will enable the City to continue to address the problem the City faces with illegal dumping.

Recommendation: The level of staffing for the Clean Cities Section should be reduced by two positions: a Senior Customer Services Representative and a Construction handyman .

Recommendation: The Working Foremen Skilled Laborer should be responsible for responsible for inspection of the 163 properties that are cleaned up by this program, assessment of the condition of the property including taking digital photographs, the condition of the housing, if any, and prioritization of the cleanup of these properties

(2.4) Code Enforcement Should Work More Closely With the Clean Cities Section Regarding Liens.

To date, the Code Enforcement Department has not worked together with the Clean Cities Section regarding liens placed on properties for failure to maintain these properties. In 2003-04, the Clean Cities Section cleaned up 73 lots and boarded up 16 locations as a result of court orders obtained by Code Enforcement. A total of 141.57

tons of debris was collected from these sites. The cost estimated by the Clean Cities Section for these services approximates \$98,321.

It is unclear whether the Code Enforcement Department is recovering these costs through liens. The managers from the Code Enforcement Department are not meeting routinely with the manager for the Clean Cities Section to discuss these liens, the status of the liens, the amount of money collected, court orders that will be issued in the near term, etc.

Recommendation: The manager for the Code Enforcement Department should meet with the Working Foremen Skilled Laborer for the Clean Cities Section on a monthly basis to discuss the status of the liens, the amount of money collected, court orders that will be issued in the near term, etc.

3. THE CONTRACTS ADMINISTRATOR POSITION SHOULD BE REALLOCATED TO THE PURCHASING DIVISION, AND ENGINEERING SHOULD ASSUME RESPONSIBILITY FOR CAPITAL PROJECT CONTRACT ADMINISTRATION

The Contracts Administrator fulfills a number of roles in regards to administration of capital project contracts. These include such roles as the following:

- Prepares the bid documents;
- Advertising the contract;
- Conducts the pre-bid conference;
- Reviews the bids with the Engineering Division;
- Prepares the documents and contracts necessary to award the bid; and
- Processes payment requests and progress payments for the contractors.

The Engineering Division should perform these tasks. There is sufficient staff within the Engineering Division to provide these tasks. It is the norm in municipal engineering to provide these services, either the project manager or clerical support

within the Engineering Division. In addition, using cost of construction guidelines as guidelines for staffing, there is insufficient capital project workload to warrant a full-time contract administrator. The capital project construction program is presented in the table below excluding the amount budgeted for road design. All of these projects are minor in nature in terms of their size and complexity.

| | |
|-----------------------------|--------------------|
| Main Arterial Overlay | \$700,000 |
| Residential Overlay | \$1,400,000 |
| Sidewalk Replacement | \$300,000 |
| North Main Street Sidewalks | \$50,000 |
| Private Street Construction | \$200,000 |
| Crack sealing | \$200,000 |
| Traffic Signals | \$200,000 |
| Route 20A | \$1,500,000 |
| TOTAL BUDGET | \$4,550,000 |

Recommendation: The Contracts Administrator position should be reallocated to the Purchasing Division.

4. TWO VACANT POSITIONS IN ADMINISTRATION SHOULD BE ELIMINATED.

There are two positions within Public Works Administration that are vacant. The project team understands that the City planned on the elimination of these positions in the next fiscal year, but the project team, after evaluating these positions and wanted to clarify that these positions can and should be eliminated. These positions include the following:

- Comptroller;
- Project Director.

Recommendation: Two vacant positions within Public Works Administration – a Comptroller and a Project Director - should be eliminated.

5. THE NUMBER OF STAFF ALLOCATED TO THE CUSTOMER SERVICE CENTER SHOULD BE REDUCED TO FOUR POSITIONS THAT SHOULD BE SUPPLEMENTED DURING APRIL, MAY AND JUNE.

The workload volume for the Customer Service Center in 2004 is presented in the table below. Important points to note concerning the data presented in the table are presented below the table.

| Month | Number of Calls | % of Total |
|--------------|------------------------|-------------------|
| January | 2,876 | 5.3% |
| February | 2,711 | 5.0% |
| March | 4,862 | 9.0% |
| April | 5,542 | 10.2% |
| May | 6,177 | 11.4% |
| June | 6,970 | 12.8% |
| July | 4,653 | 8.6% |
| August | 4,736 | 8.7% |
| September | 4,314 | 7.9% |
| October | 3,853 | 7.1% |
| November | 4,244 | 7.8% |
| December | 3,386 | 6.2% |
| TOTAL | 54,324 | 100.0% |

- Approximately 22% of these calls are incoming radio dispatches.
- The peak months for calls include April, May, and June. In the peak month – June – the Customer Service Center approximated 317 calls per day or an average of 42 calls per day (including incoming radio dispatches).
- Those months with the lowest number of calls include January, February, and December. In the month with the lowest call volume – February – the Customer Service Center approximated 150 calls per day or an average of 20 calls per day (including incoming radio dispatches).

To evaluate the staffing requirements for the Customer Service Center, the project team utilized an Erlang C Calculator program. To analyze the staffing requirements, the project team first utilized the average number of incoming calls based upon 2004. Next, the project team utilized an average duration of for each call: the project team utilized 180 seconds for each call (including incoming radio dispatches),

and a 30 second wrap up. Finally, the project team used an average answering delay of 20 seconds that the Customer Service Center should be prepared to tolerate for incoming calls. If you provide too many Customer Service Representatives, the Public Works Department would obviously be wasting valuable resources. However, if the Public Works Department provide too few Customer Service Representatives, the Department runs the risk of imposing unacceptably long ring times on their callers, or even worse, suffering from abandoned calls.

The formula utilized by the project team is based on the Erlang C traffic model which is an established model for predicting telecommunications performance under situations in which offered calls are queued.

The Erlang C Traffic model, which is used by the Erlang C Calculator, was established by A.K. Erlang, a Danish scientist who was responsible for much of the early work in telephone traffic theory. It is an analytical formula for modeling telecommunications systems that involve queuing. As such, it can be applied to the design and analysis of inbound call centers that queue calls before presenting them to Customer Service Centers. The model makes the following assumptions:

- Calls are presented randomly to the servers (Poisson arrivals);
- Callers finding the system busy will wait (that is, they will be queued);
- Service times are exponential;
- Callers are answered in the order in which they arrived; and
- Callers are directed towards the first available Customer Service representative.

It is important to understand that there is a bare minimum number of Customer Service Representatives the Public Works Department will need, regardless of the call

answering delays it is prepared to tolerate. For instance, if during an hour, you receive a total of 10 calls, you must, at the very minimum, provide three Customer Service Representatives for answering these calls. If you fail to provide this number of agents, your call queue will constantly increase and incoming calls will be abandoned. However, if the number of calls doubles to 20 calls per hour, the number of Customer Service Representatives required only increases to four.

By providing more than the bare minimum number of Customer Service Representatives, you regain control of the queue of incoming calls that results in a stable and predictable situation. The Erlang C Calculator will never return a number of Customer Service representatives that is lower than this bare minimum.

Using this model for the peak months of April, May and June indicates the following:

- The average daily number of calls in June – the peak month – amounted to 317 or an average of 42 calls per hour;
- The project team utilized an average of 180 seconds for each call (including incoming radio dispatches) and a 30 second wrap up; and
- The project team utilized an average answering delay of 20 seconds that the Customer Service Center should be prepared to tolerate for incoming calls.

Based upon this data, the Customer Service Center will require five Customer Service Representatives during these three months.

Using the model for average months – months such as September or November – indicates the following:

- The average daily number of calls in September amounted to 205 or an average of 27 calls per hour.
- The project team utilized an average of 180 seconds for each call (including incoming radio dispatches) and a 30 second wrap up; and

- The project team utilized an average answering delay of 20 seconds that the Customer Service Center should be prepared to tolerate for incoming calls.

Based upon this data, the Customer Service Center will require four Customer Service Representatives during these more typical months. The Public Works Department was authorized six Customer Service Representatives in the fiscal year 2004-05 budget, excluding the four authorized for the Towing and Storage Division.

Recommendation: The Customer Service Center should be authorized four Customer Service Representatives. Two Customer Service Representative positions, vacant at the present time, should be eliminated.

Recommendation: The Customer Service Center should be authorized “sundry labor” equivalent to a 0.5 full-time equivalent Customer Service Representative for the peak months, leave coverage, and training coverage.

6. THE BUSINESS OFFICE IS STAFFED APPROPRIATELY GIVEN THE CUMBERSOME NATURE OF THE LEGACY FINANCIAL AND HUMAN RESOURCE INFORMATION SYSTEM.

The Business Office consists of four units: Payroll, Accounts Payable, Accounts Receivable, and Inventory (or stores vouchers). The Business Office is assigned a Principal Accountant, a Senior Accountant, two Principal Clerk Typists and one Senior Clerk Typist. These positions are assigned the following responsibilities:

- **The Senior Accountant is responsible for the entire payroll each week.** The Principal Accountant backs up the Senior Accountant. The payroll workload approximates 300 employees in the Public Works Department. The benchmark utilized by the project team is one payroll employee per 350 to 375 employees.
- **The accounts payable workload is administered by a Principal Clerk Typist and Senior Clerk Typist.** These two staff are responsible for opening office mail, obtaining the purchase requisitions from the Stores Program, forwarding the purchase requisition to the Purchasing Division for approval, matching the invoices to the purchase order issued by the Purchasing Division, entering the invoice into the legacy finance and human resource information system (the amount of the invoice, verifying the information, the cost center or job number, printing the “bills” for the City Auditor, reconciling the bills, etc. These two staff process an average of 525 invoices per month. Given the salary and fringe

benefit costs for these two employees, the Public Works Department is spending approximately \$11.25 to process each invoice. This compares to a median reported by two-thirds of companies participating in an IOMA survey of \$8.50 (although best practice companies are achieving levels of \$3 per invoice). The number of invoices processed each month – an average of 260 for each of these two clerk typists – compares to benchmarks of 1,500 per month for smaller firms using best practices. The staff from the Stores Program enter the purchase requisitions into the legacy finance and human resource information system, and not the staff from the divisions within the Public Works Department that originate the purchase requisition. Staff from the Business Office still utilizes a hard copy of the purchase requisition.

- **Accounts receivable is administered by a Principal Clerk Typist.** This Principal Clerk Typist enters stores vouchers generated by the staff of the Stores Program into the legacy finance and human resource information system for reimbursement by the Water and Sewer Commission, Chapter 90, and the General Fund. The staff of the Stores Program writes a stores voucher, and then the staff of the Business Office enters the information from the stores voucher into the legacy finance and human resource information system.

There are clearly opportunities to enhance the cost-effectiveness of the Business Office, but these opportunities cannot be realized given the limitations of the legacy finance and human resource information system and the cumbersome nature of this information system.

5. ANIMAL CONTROL DIVISION

5. ANIMAL CONTROL DIVISION

This chapter presents an analysis of the Animal Control Division including a number of issues including:

- The lease purchase agreement for the Thomas J. O'Connor Animal Control Center; and
- The levels of staffing for the Animal Control Division.

A total of 11 positions are authorized for the Center. This does not include an Executive Director. The Board of Animal Control Supervisors authorized the addition of an Executive Director position during this fiscal year (without an associated increase in the annual assessment, however), increasing total staffing for the Center to 12 positions. All of these positions are contract employees; none of these positions are full-time employees of the City of Springfield.

1. THE CITY SHOULD EXERCISE THE OPTION TO PURCHASE THE THOMAS J. O'CONNOR ANIMAL CONTROL CENTER.

The Thomas J. O'Connor Animal Control Center is a 22,739 square foot building on approximately 2.53 acres of land. The City of Springfield entered into a twenty-five year lease-purchase agreement on March 18, 2003 for this facility. The agreement requires payments from the City for this facility as noted below.

- The lease was intended to be "net/net/net" to the landlord, with the City paying the costs of utilities, taxes, insurance, and common area maintenance charges.
- From years 1-10 of the lease-purchase agreement, the City pays the landlord an annual sum of \$380,000 payable in equal monthly installments.
- From years 11-15 of the lease-purchase agreement, the payment by the City is adjusted by the percentage increase in the Consumer Price Index for All Urban Consumers, Northeast Urban (CPI-U). This adjustment is based upon the percentage increase in the consumer price index from the effective date the lease became effective (March 18, 2003) to the last day of year 10 of the lease-

purchase agreement. The agreement specifically states that the increase shall not exceed 115% of the payment in effect during years 1–10.

- From years 16-20 of the lease-purchase agreement, the payment by the City is adjusted by the percentage increase in the Consumer Price Index for All Urban Consumers, Northeast Urban (CPI-U). This adjustment is based upon the percentage increase in the consumer price index from the end of year 15 for each year for the period from years 16-20. The agreement specifically states that the increase shall not exceed 115% of the payment in effect during years 11–15.
- From years 21-25 of the lease-purchase agreement, the payment by the City is adjusted by the percentage increase in the Consumer Price Index for All Urban Consumers, Northeast Urban (CPI-U). This adjustment is based upon the percentage increase in the consumer price index from the end of year 15 for each year for the period from years 21-25. The agreement specifically states that the increase shall not exceed 115% of the payment in effect during years 16–20.
- The City has the option to purchase the facility, but the option to purchase agreement appears to indicate that the City may first exercise the option at the end of lease year five or March 18, 2008. The cost, at that time, to purchase the facility is \$3,998,974.71. However, there are options available to the City if it wished to exercise that option immediately including defaulting on the agreement.

Under these terms, the City's payment is likely to increase from \$380,000 in year 1 of the agreement to \$577,932 in years 21-25 of the agreement, and the total payment by the City for this facility will approximate \$11,387,000. This compares to the initial cost to exercise the purchase option of \$3,998,974.71

The project team evaluated the cost effectiveness of exercising the option to purchase the facility. The table below presents the City's lease purchase payments over the twenty-five life of the lease-purchase agreement, and the amount of money the City would generate if it invested the funds required to exercise the option to purchase the facility. The amount of money the City would generate if it invested the funds, rather than exercise the option to purchase, is presented under three different compounded

interest rate scenarios: 3%, 4%, and 4.5%. Important points to note concerning the data presented in the table are presented on the following page.

| | Lease-Purchase Payments | Bank the Purchase Price @3% Interest | Bank the Purchase Price @4% Interest | Bank the Purchase Price @4.5% Interest |
|-------------|--------------------------------|---|---|---|
| 18-Mar-2004 | \$380,000 | | | |
| 18-Mar-2005 | \$380,000 | | | |
| 18-Mar-2006 | \$380,000 | \$3,998,974 | \$3,998,974 | \$3,998,974 |
| 18-Mar-2007 | \$380,000 | \$4,118,943 | \$4,158,933 | \$4,178,928 |
| 18-Mar-2008 | \$380,000 | \$4,242,512 | \$4,325,290 | \$4,366,980 |
| 18-Mar-2009 | \$380,000 | \$4,369,787 | \$4,498,302 | \$4,563,494 |
| 18-Mar-2010 | \$380,000 | \$4,500,880 | \$4,678,234 | \$4,768,851 |
| 18-Mar-2011 | \$380,000 | \$4,635,907 | \$4,865,363 | \$4,983,449 |
| 18-Mar-2012 | \$380,000 | \$4,774,984 | \$5,059,978 | \$5,207,704 |
| 18-Mar-2013 | \$380,000 | \$4,918,234 | \$5,262,377 | \$5,442,051 |
| 18-Mar-2014 | \$437,000 | \$5,065,781 | \$5,472,872 | \$5,686,943 |
| 18-Mar-2015 | \$437,000 | \$5,217,754 | \$5,691,787 | \$5,942,856 |
| 18-Mar-2016 | \$437,000 | \$5,374,287 | \$5,919,458 | \$6,210,284 |
| 18-Mar-2017 | \$437,000 | \$5,535,515 | \$6,156,237 | \$6,489,747 |
| 18-Mar-2018 | \$437,000 | \$5,701,581 | \$6,402,486 | \$6,781,786 |
| 18-Mar-2019 | \$502,550 | \$5,872,628 | \$6,658,586 | \$7,086,966 |
| 18-Mar-2020 | \$502,550 | \$6,048,807 | \$6,924,929 | \$7,405,880 |
| 18-Mar-2021 | \$502,550 | \$6,230,271 | \$7,201,926 | \$7,739,144 |
| 18-Mar-2022 | \$502,550 | \$6,417,179 | \$7,490,003 | \$8,087,406 |
| 18-Mar-2023 | \$502,550 | \$6,609,695 | \$7,789,603 | \$8,451,339 |
| 18-Mar-2024 | \$577,932 | \$6,807,986 | \$8,101,188 | \$8,831,649 |
| 18-Mar-2025 | \$577,932 | \$7,012,225 | \$8,425,235 | \$9,229,073 |
| 18-Mar-2026 | \$577,932 | \$7,222,592 | \$8,762,244 | \$9,644,382 |
| 18-Mar-2027 | \$577,932 | \$7,439,270 | \$9,112,734 | \$10,078,379 |
| 18-Mar-2028 | \$577,932 | \$7,662,448 | \$9,477,244 | \$10,531,906 |
| 23 Years | \$10,627,410 | | | |

- Over the twenty-three years from March 18, 2006 to March 18, 2028, the City of Springfield would make lease purchase payments amounting to \$10,627,410.
- In the current interest rate environment, with the City's total book rate of return for its investment portfolio likely approximating 3% (the Federal Funds Rate at 2.75%), it would appear that the City could save almost \$3 million by exercising its option to purchase the facility at the present time.
- If the current interest rate environment changed, and the City's total book rate of return for its investment portfolio increased to 4%, the City could save \$1.1 million by exercising its option to purchase the facility at the present time.

- If the current interest rate environment changed, and the City's total book rate of return for its investment portfolio increased to 4.5%, the savings to the City would be a little less than \$100,000.

Over the last fifteen years, the Federal Funds Rate has varied ranging from a high of 8% in July 1990 to a low of 1% in June 2003. In the last three years, it has remained under 3%, and it has been 4% or less since May 2001, almost four years.

If the negotiations to purchase this facility should provide difficult to conclude, the City of Springfield should explore abandoning the facility and contracting with a non-profit, such as the MSCPA, to provide animal shelter services. This is not an uncommon service delivery approach in many parts of the United States.

Recommendation: The City should exercise the option to purchase the Thomas J. O'Connor Animal Control Center.

Recommendation: If the negotiations to purchase this facility should provide difficult to conclude, the City of Springfield should explore abandoning the facility and contracting with a non-profit, such as the MSCPA, to provide animal shelter services.

2. THE THOMAS J. O'CONNOR ANIMAL CONTROL CENTER SHOULD CONDUCT DAILY COUNTS OF ANIMALS IN THE SHELTER AND DEVELOP MONTHLY REPORTS FOR THE PUBLIC WORKS DIRECTOR.

The Humane Society of the United States (HSUS) has developed a number of guidelines for the operation of animal control centers. One of these guidelines concerns daily counts of animals in the shelter. The guideline is presented below.

"All animals should be counted at the start and at the end of each day, with the numbers recorded by species in a permanent journal. Each day, these totals should be balanced against the card records. A daily log should be kept to record animals received, adopted, euthanized, or returned to owner. In the records, animals should be classified according to species, sex, and age. (For example, separate adults from those under four months of age.)"

The Thomas J. O'Connor Animal Control Center does not conduct daily counts, but should begin doing so immediately. This count should separate the animals in each of the different holding facilities at the Center including the following:

- Cat adoption cages;
- Cat holding cages;
- Cat community rooms;
- Dog adoption cages - large dog;
- Dog adoption cages - small dog;
- Dog holding cages - large dog;
- Dog holding cages - small dog;
- Clinic holding cages - large dog;
- Clinic holding cages - small dog or cat;
- Whelping room; and
- Miscellaneous (grooming/Euthanasia)

The Center does count the number of dogs that were impounded; it does not count the number of cats impounded. While cat intake data is not available for the Center (the MSPCA adoption center has historically cared for the stray cat population, and not the Thomas J. O'Connor Animal Control Center), the number of impounds reported for dogs in 2004 amounts to an average of 5.5 dogs impounded per day. This is significantly less than the project team would expect for a shelter that serves a population of 274,462. In fact, it is approximately 15% the animal intake that the project team would expect for the population in the cities served by the Center. The Executive

Director should take steps to quality control the data collected by the Center to assure that animal intakes are recorded accurately.

The Center has just begun in January 2005 to record the calls for service. The Center should utilize that data (including the city of origin for the calls for service), the daily counts, and the animals impounded (including the city of origin) as the basis of a monthly report that should be provided to the Public Works Director. This data should include the most recent month, the fiscal year-to-date, and last fiscal year to date at the same month.

Recommendation: The Thomas J. O'Connor Animal Control Center should conduct a daily inventory of animals in the Center at the start of the day and at the end of the day in accordance with HSUS guidelines.

Recommendation: The Executive Director should take steps to quality control the data collected by the Center to assure that animal intakes are recorded accurately.

Recommendation: The Thomas J. O'Connor Animal Control Center should provide a monthly performance report to the Public Works Director that includes calls for service, animals impounded, and the daily count.

Recommendation: The Thomas J. O'Connor Animal Control Center should count the number of cats impounded.

3. THE STAFFING PLAN FOR THE THOMAS J. O'CONNOR ANIMAL CONTROL CENTER SHOULD BE ADJUSTED.

The current staffing plan for the Thomas J. O'Connor Animal Control Center, as presented in the fiscal year 2004-05 budget for the City of Springfield, is presented in the table below.

| Class Title | No. of Authorized Positions |
|---------------------------|------------------------------------|
| Kennel Attendant | 2 |
| Animal Control Officer | 3 |
| Veterinary Technician | 1 |
| Animal Control Supervisor | 1 |
| Operations Manager | 1 |

| Class Title | No. of Authorized Positions |
|----------------------------|------------------------------------|
| Operations Assistant | 1 |
| Front Desk Supervisor | 1 |
| Director of Administration | 1 |
| TOTAL | 11 |

A total of 11 positions are authorized for the Center, but this did not include an Executive Director. The Board of Animal Control Supervisors authorized the addition of an Executive Director position during this fiscal year (without an associated increase in the annual assessment, however), increasing total staffing for the Center to 12 positions.

This is not a significant number of staff for a facility of this size, but the facility has been overbuilt by a significant amount. Although there are 259 holding cages, the daily population is estimated by the Executive Director at 50 in the winter and in 150 in the summer. The Center has also made excellent use of volunteers in its operation.

The project team recommends that the staffing plan for the Center be adjusted as presented below.

- **The Animal Control Supervisor position should be eliminated.** There are three Animal Control Officers and three Animal Control Officers. With only three Animal Control Officers, a supervisor is hardly necessary. This position is also utilized to dispatch calls for service; this responsibility should be assigned to the support staff at the Center.
- **Three Animal Control Officers should be allocated to field patrol.** The Center has not collected call for service until the beginning of this calendar year. In January, there were a total of 108 calls for service or 3.5 calls for service per day. In February, there were 193 calls for service or 6.9 calls for service per day. This is little workload for the three Animal Control Officers. However, the Executive Director estimated that the number of calls for service increases to an estimated 15 to 20 per day during the warmer months of the year. That would result in approximately 4,500 to 5,000 calls for service annually. The project team has utilized a guideline for staffing of animal control officers of each responding to a range of 1,000 to 2,500 calls for service per animal control officer per year as a medium level of service. The allocation of three Animal Control Officers would

result in an estimated 1,500 to 1,666 calls for service per animal control officer. This falls within this range.

- **Five Animal Caregivers should be allocated to the care, cleaning and feeding of animals at the Center.** The Center does not conduct daily counts of the animals housed at the Center. However, the Executive Director estimated the Center houses an average daily population of 50 animals in the winter and 120 in summer. The HSUS has developed general staffing recommendations for kennel caretaking. These recommendations are based upon the average daily population, the provision of an average of 15 minutes of care to each animal for cleaning and feeding to develop the staffing needed each day. In the winter, five Animal Caregivers should be sufficient. This number will not be sufficient in the summer, and the Center will need to rely on its volunteers to provide adequate levels of cleaning and feeding.
- **A Principal Clerk Typist and Clerk Typist should be allocated to the provision of office support.** These positions should be assigned responsibility for providing support at the Center including responding to walk-in traffic, intake/owner redemptions/adoptions, animal licensing and other related tasks.
- **The Executive Director position should be allocated to providing management of the Center and supervision of the staff.** This position is essential to addressing the problems that have existed at the Center and to provide the professional management required for this facility.
- **Other positions at the Center, including the Veterinary Technician, Operations Manager, Operations Assistant, Front Desk Supervisor, Administration Director, and Kennel Attendant, should be eliminated.** Some of these positions have been vacant such as the Administration Director, Veterinary Technician, and Operations Manager. The other positions - Kennel Attendant, Operations Assistant, Front Desk Supervisor, and Kennel Attendant - duplicate proposed staffing recommended above.
- **These positions should be full-time employees of the City of Springfield.** These employees should be employees of the City will all of the rights and responsibilities.

Recommendation: The staffing plan for the Thomas J. O'Connor Animal Control Center should be adjusted to provide three Animal Control Officers, five Animal Caregivers, a Principal Clerk Typist and Clerk Typist, and an Executive Director.

4. THE HOURS THAT THE THOMAS J. O'CONNOR ANIMAL CONTROL CENTER IS OPEN TO THE PUBLIC SHOULD BE EXPANDED.

The Thomas J. O'Connor Animal Control Center is only open from 12 noon to 4:30 PM Monday through Saturday. These hours should be expanded. The level of staffing should enable the Center to be open for at least seven hours a day, Monday through Saturday. These hours should include being open until 5:30 PM on weekdays so that members of the public can redeem their pet.

Recommendation: The hours that the Thomas J. O'Connor Animal Control Center should be expanded to seven hours a day including being open until 5:30 PM.

5. THE THOMAS J. O'CONNOR ANIMAL CONTROL CENTER SHOULD ACQUIRE CHAMELEON ANIMAL SHELTER SOFTWARE.

More animal shelters than ever before are using shelter management software to track the animals and residents they serve. And the Internet has provided animal shelters with powerful new medium through which to promote their services and animals. These events have led to changes in the shelter software arena, too. Some programs now allow users to include photos of sheltered animals in the database.

The Thomas J. O'Connor Animal Control Center operates with paper-based record keeping systems entirely. This has resulted in non-existent management reports and inaccurate data.

The Center should acquire the Chameleon animal shelter software from HLP Inc. This is the premier shelter software and is utilized in over 150 shelters – mostly large shelters. The system is capable of supporting a number of data collection and recording tasks such as the following:

- Kennel intake, redemptions, and adoptions;
- Animal records including spay and neuter, photos, history, behavior profiles, etc.;

- Licensing including follow-up;
- Finance including fees, inventory, invoices, fee calculation, etc.;
- Field patrol including calls, citations, bite reports, etc.;
- Staff training records and scheduling; and
- A pictorial display of animals at the shelter for purposes of adoption including Internet access.

The cost of the system is \$9,800. The cost of training approximates \$1,000 per day. The cost of technical support approximates \$1,000 per computer workstation per year.

Recommendation: The Thomas J. O'Connor Animal Control Center should acquire Chameleon animal shelter software.

6. THE CONTRACT WITH THE VETERINARIAN UTILIZED BY THE THOMAS J. O'CONNOR ANIMAL CONTROL CENTER SHOULD BE TERMINATED AND A REQUEST FOR PROPOSAL IMMEDIATELY ISSUED.

The Thomas J. O'Connor Animal Control Center contracts with a local veterinarian for approximately \$25,000 annually to provide a number of services including euthanasia. The Center identified a number of problems with the veterinarian that it currently utilizes. These include the problems identified below.

- The veterinarian only visits the Center once a week for approximately one and one-half-hours each visit.
- Most dogs are reportedly brought into the euthanasia room on a control stick regardless of whether their overt behavior warrants this treatment.
- Frequently other dogs are reportedly are in the vicinity and witness the euthanasia.
- Cats are reportedly given a direct cardiac injection while awake. This is in direct contradiction of the AVMA panel on Euthanasia recommendations.

- Cats are reportedly frequently euthanized in their cages in the holding area rather than in the euthanasia room.
- Death is reportedly verified by the veterinarian using his fingers to check for a heartbeat. A stethoscope is apparently not utilized, nor is cardiac standstill verified by other means.

These are important issues. The few hours that the veterinarian is working given the annual payment is also important. The contract with the existing veterinarian should be immediately terminated. A request for proposal should be issued and request the number of hours at the Center the proposing veterinarian should propose the number of hours that he or she would provide at the Center for the \$25,000 annual payment.

Recommendation: The contract with the existing veterinarian should be terminated immediately and a Request for Proposal issued for a veterinarian to provide services to the Center.

7. THE THOMAS J. O'CONNOR ANIMAL CONTROL CENTER SHOULD REQUIRE ALL VETERINARIANS IN SPRINGFIELD TO PROVIDE THE CENTER WITH COPIES OF RABIES CERTIFICATION FORMS.

Many animal owners take their animals to the veterinarian for preventive health care as well as medical treatment, even if the animal is not licensed. As a result, veterinarians come in contact with a greater number of animals than the Center licenses.

The City of Springfield should require that veterinarians providing services to residents of Springfield provide the Thomas J. O'Connor Animal Control Center with a copy of the veterinarian rabies certification forms to update vaccination records and validate an active license for the animal. If the annual license is expired, or the animal does not yet have a license (and does not exist in the Center's records system), a license notification letter should be sent to the animal's owner.

Possible language that could be included in the City's animal control ordinance is

presented below.

“Every veterinarian who vaccinates or causes or directs to be vaccinated in the City any dog with anti-rabies vaccine shall certify that such animal has been vaccinated. Every veterinarian shall submit to the City a copy of the City-approved anti-rabies vaccination form, within ten (10) days of the beginning of each month, for any dog that he/she vaccinates or directs to be vaccinated with anti-rabies during the previous month. An Animal Control Officer or Animal Licensing Officer shall have the right to inspect records of rabies vaccinations during normal business hours.”

Recommendation: The City of Springfield should require all veterinarians in Springfield to provide the Thomas J. O’Connor Animal Control Center with a copy of the rabies certification form.

8. THE THOMAS J. O’CONNOR ANIMAL CONTROL CENTER SHOULD SPAY OR NEUTER ALL DOGS AND CATS ADOPTED FROM THE CENTER.

Spaying and neutering reduces the proliferation of unwanted and stray animals in the City, reduces overcrowding at the shelters, and reduces euthanasia rates. The Thomas J. O’Connor Animal Control Center does not offer spay and neuter services although it does offer refunds of deposits if dogs or cats adopted from the Center are subsequently spayed or neutered. The Thomas J. O’Connor Animal Control Center should spay or neuter all dogs or cats adopted from the Center. This will require two steps.

- As part of the Request for Proposal for veterinary services, the veterinarian that provides services at the Center should spay or neuter all of the dogs or cats that are adopted from the Center.
- The Center should purchase equipment necessary to provide spay and neuter services at the Center. This would include the equipment listed below that has a total cost of approximately \$4,200.

The Center has recently requested grant funds to purchase this equipment. If the grant application is unsuccessful, the member cities should fund the capital cost associated with this equipment.

Recommendation: The Thomas J. O’Connor Animal Control Center should spay or neuter the dogs and cats adopted from the Center by providing these services at the Center through a contract veterinarian.

6. ENGINEERING AND TRAFFIC DIVISION

6. ENGINEERING AND TRAFFIC DIVISION

This chapter presents an analysis of the Engineering and Traffic Division including:

- The City's long-term capital improvement program planning;
- The pavement management program and condition assessment of paved streets;
- The development review process;
- The level of staffing including engineering, traffic engineering, the Conservation Commission, and the Board of Public Works;
- The plan of organization for engineering;
- Opportunities to increase Chapter 90 revenue received from the State; and
- The process utilized by the Public Works Department to manage the capital improvement program.

The Engineering and Traffic Division is authorized forty-one staff in the fiscal year 2005 budget including parking meters, but excluding the Conservation Commission and the Board of Public Works. Thirteen of these positions were vacant as of April 12, 2005.

The Division provides a variety of services including the following:

- Capital project design and construction management;
- Pavement condition assessment;
- Capital project design surveying;
- Development-related infrastructure construction management and inspection;
- Issuance of permits for right of way excavation;
- Maintenance of records of infrastructure;
- NPDES management and monitoring;

- Conservation Commission; and
- Maintenance and repair of signalized intersections, signs, striping, pavement legends and parking meters.

The Engineering and Traffic Division has a wide range of responsibilities.

1. THE CITY SHOULD PREPARE AND THE CITY COUNCIL SHOULD ADOPT A FIVE-YEAR CAPITAL IMPROVEMENT PROGRAM.

The Government Finance Officers Association has developed a number of best practices for the development of a multi-year capital improvement program. These best practices are presented below.

- **“A government should identify and conduct an assessment of its capital assets, including the condition of the assets and factors that could affect the need for or ability to maintain the assets in the future.** The capital assets of a government and their condition are critical to the quality of services provided, and hence are important in determining whether the needs and priorities of stakeholders can be met.” North Attleborough completed a Municipal Infrastructure Report. The report is available on their Internet. The analysis identified, evaluated, and prioritized all of the capital needs for the future. This analysis could serve as a guide for the Public Works Department.
- **“A government should adopt policies and plans for capital asset acquisition, maintenance, replacement, and retirement.** Policies and plans for acquisition, maintenance, replacement, and retirement of capital assets help ensure that needed capital assets or improvements receive appropriate consideration in the budget process and that older capital assets are considered for retirement or replacement. These policies and plans are necessary to plan for large expenditures and to minimize deferred maintenance.”
- **“A government should develop specific capital project options for addressing capital needs that are consistent with financial, programmatic, and capital policies and should evaluate alternatives for acquiring the use of capital assets.** Capital project planning is necessary to give adequate consideration to longer-range needs and goals, evaluate funding requirements and options, and achieve consensus on the physical development of the community. An evaluation of alternative mechanisms helps ensure that the best approach for providing use of a capital asset or facility is chosen based on the policies and goals of the government. A government should have a process that identifies capital projects that are needed to achieve goals and a general time frame in which these assets will be needed. This assessment should consider need, life cycle costs (including operating costs), impact on services,

beneficiaries of the project, financing issues, and other impacts. Plans for acquiring capital assets should be part of or consistent with land use, transportation, or other long-range plans of the community or area. Options for acquiring the use of capital assets and facilities should be examined. In some cases, the process for evaluating capital acquisition alternatives is linked with a corresponding process for evaluating service delivery alternatives.”

- **“A government should develop a capital improvement plan that identifies its priorities and time frame for undertaking capital projects and provides a financing plan for those projects.** The cost of desired capital projects will usually substantially exceed available funds in most governments. Development of a capital improvement plan provides a framework for prioritizing projects and identifying funding needs and sources. A process should exist for evaluating proposed capital projects and financing options, and developing a long-range capital improvement plan that integrates projects, time frames, and financing mechanisms. The plan, including both capital and operating costs, should project at least five years into the future and should be fully integrated into the government’s overall financial plan. The process for developing the plan should allow ample opportunity for stakeholder involvement in prioritizing projects and review. The capital improvement plan should be included in a budget document, either in a single document describing both the operating and capital budgets or in a separate document describing the capital improvement plan and capital budget. The plan should be approved by the governing body.”

The City of Springfield does not meet these best practices. The City has not developed five-year capital improvement program. The City should initiate a process, coordinated by the Finance Department, to develop a five-year capital improvement program. That process should approximate the following:

- The capital budget process should begin in September with the Mayor and City Council providing general guidance and philosophies for future capital direction, and with the Mayor providing supplemental financial information and indicating the availability of various funding mechanisms.
- Community input should be obtained between September and October. This should involve requesting input from the community regarding priorities for capital projects.
- The City’s departments would then prepare capital budget requests. Cost projections would be reviewed by Engineering. A staff committee from the City’s departments would review, evaluate, and prioritize requests among all City departments.

- Prioritized requests would come to the Finance Department in November. The Finance Department should evaluate the projects by clarifying the purpose for the project and the project description. Next, the department would evaluate the project using established project evaluation criteria (developed by the Finance Department), which also provide for project scoring. Evaluation criteria include recommendations of plans and studies, public safety impact, operation and maintenance cost impact, community benefit, project cost, and community priorities. Once this evaluation process is complete, project scoring is used to develop the prioritized capital project needs list. The Finance Department would then recommend a capital program.
- The Mayor and the City Council would make preliminary decisions in January so that education of the public can begin before the operating budget process is completed. In June, the City Council would adopt the capital program as a part of the budget.

As an initial step in this effort, the Finance Department should develop a capital improvement program budget preparation manual to be utilized as a guideline by the departments in preparing their capital project budget requests.

Recommendation: The City should prepare and the City Council should adopt a five-year capital improvement program.

Recommendation: The Finance Department should prepare a capital improvement program budget preparation manual.

2. THE PUBLIC WORKS DEPARTMENT SHOULD CONDUCT A CONDITION ASSESSMENT OF ITS CAPITAL ASSETS AND DEVELOP AN INFRASTRUCTURE MASTER PLAN.

A best practice developed by the Government Finance Officers Association (GFOA) is that a government should adopt policies and plans for capital asset acquisition, maintenance, replacement, and retirement. As the GFOA notes, “policies and plans for acquisition, maintenance, replacement, and retirement of capital assets help ensure that needed capital assets or improvements receive appropriate consideration in the budget process and that older capital assets are considered for retirement or replacement. These policies and plans are necessary to plan for large

expenditures and to minimize deferred maintenance.”

The output of this condition assessment should be the development of an infrastructure master plan that provides a multi-year replacement and renewal schedules, and establishes linkages of capital expenditures with the annual operating budget. As noted previously, the Town of North Attleborough has developed such a plan. This plan includes the following:

- A physical inventory of the infrastructure element;
- An analysis of the condition, age, and repair/replacement needs;
- Computerization of the data associated with this information;
- Determination of the cost to repair/replace over a five-year period;
- Prioritization of the individual projects for replacement or repair; and
- Include bridges, roads, sidewalks, sanitary sewer collection system, storm drain collection system, and the water distribution system.

Recommendation: The Public Works Department should prepare an infrastructure master plan.

3. THE PUBLIC WORKS DEPARTMENT SHOULD ESTABLISH A PAVEMENT MANAGEMENT PROGRAM.

Streets represent the largest capital investment for the City of Springfield. The City has 372.63 centerline miles of streets. Maintaining and operating these streets typically involves complex decisions about how and when to overlay or apply surface treatments such as seal coats to keep the street performing and operating costs at a reasonable level. In fiscal year 2000-01, the City is expended \$2,100,000 for overlay of its streets. (The City does not use seal coats). This represents an annual expenditure of a little less than two-tenths of 1% of the estimated construction value of the City’s street system, which approximates \$0.9 billion.

The streets scheduled for paving in 2005 in Springfield, and the amount of centerline miles, include the following:

- Pavement improvements associated with Chapter 90: 11.49 miles;
- Parker Street Underpass funded by the Massachusetts DOT: 1.14 miles;
- Route 20-A project funded by the State of Massachusetts: 3.54 miles; and
- State Street project funded by the State of Massachusetts: 3.07 miles.

This amounts to 19.24 centerline miles of streets. If the City sustained this each year, the City would be on a 19-year cycle for street overlay and reconstruction. However, this is simply not the case. The City is funding (through the Water and Sewer Commission, the City's general fund, or through Chapter 90) only 11.49 centerline miles of streets. This is a 32-year cycle. This cycle exceeds benchmarks by a significant margin.

The City has a pavement management software program. It is a "homegrown" system developed in Microsoft Access. The system has limitations in that it is not an industry-standard that enables benchmarking to other local governments, nor will it readily integrate with the maintenance management software recommended in a previous chapter. In addition, it is the project team's understanding that a comprehensive condition assessment of the road system has not been undertaken for at least five years.

The Public Works Department and the City of Springfield should take a number of steps to address these challenges.

(3.1) The City Should Acquire the APWA MicroPAVER Pavement Management Software Program.

The City of Springfield should develop a systematic approach to the identification of its needs for preventive maintenance. The MAPC has completed a pavement

management manual that should serve as a guide in the development of this systematic approach. This approach should be designed to enable the City to utilize a systematic, objective, and consistent approach to evaluate existing and future pavement condition of the City's streets, and a means to help the City manage its pavement maintenance expenditures cost-effectively.

A pavement management system consists of three major components:

- A system to regularly collect pavement condition data;
- A computer database to sort and store the collected data (e.g., American Public Works Association's MicroPAVER); and
- An analysis of repair or preservation strategies and suggestions of cost-effective approaches to maintain pavement conditions.

Implementation of the pavement management software will require the City of Springfield to take the following steps:

- **Data collection and pavement network definition.** This data collection would include the construction records for the street system. This data includes the age, surfacing thicknesses, and surfacing types for all sections. Good age data is essential to the performance of computerized pavement management models that generally rely on age as the basis for performance prediction curves.
- **Pavement condition assessment.** This step involves visually inspecting the pavement based on set procedures to establish the pavement condition index for the pavement. This should be done once every three years, with 33% of the streets being evaluated each year.
- **Pavement condition prediction.** This step involves utilizing the pavement management software to calculate the current pavement condition as well as predicting what the future pavement condition will be through the use of a family of performance prediction curves.
- **Formulation of maintenance policies.** This step involves the development of treatment alternatives (i.e., slurry seal, microsurfacing, overlay, etc.), and the development of "trigger scores" for each surface treatment alternative. A "trigger score" is the set of conditions as defined by the condition indices, the performance curves, and any other pertinent data items under which a particular treatment would be feasible. For example, streets with a pavement condition

index of 40 or less (out of a possible 100) would be a “trigger score” for reconstruction.

- **Budget formulation and scenario development.** In this step, multiple budget and maintenance scenarios would be developed that would model the amount of money that can be spent in any particular year of the analysis and its impact on the pavement condition index. The model uses the allocated money to “optimize” the pavement condition index. That is, a single strategy is selected for each of the analysis sections based on the overall benefit to the street system as a whole and on the available money.

The output from the pavement management software is a list of candidate streets with the appropriate surface treatment based on the input parameters, the input condition data, and the input budget. These candidate streets can be provided to the Finance Department as input to the five-year capital improvement program.

The pavement management system needs continual updating and improvement in the form of adjustments to the performance curves, updated treatment costs, and changes in the condition indices. In addition to the list of recommended candidate streets, recommendations must be made as to overall funding levels required to meet the pavement preservation goals of the City. Running the model with a variety of budget scenarios would accomplish this.

The cost of publicly developed software, such as the American Public Works Association’s MicroPAVER, approximates \$2,000 in one-time capital outlay.

Recommendation: The Public Works Department should acquire the American Public Works Association’s MicroPAVER as its pavement management software program.

(3.2) The City Should Utilize a Mix of Engineers and Maintenance Workers from Street Maintenance to Evaluate Pavement Condition and Identify the Pavement Condition Indices.

The condition of the City’s street system should be evaluated over a three-year cycle using two two-person crews. Two two-person crews should be capable of

evaluating the condition of two to four centerline miles of streets each day. Approximately two to four staff months will be required each year to evaluate the condition of the pavement. In addition, the City should retain a consultant to provide initial training to these staff.

It is recommended that the City utilize the pavement condition evaluation methodology developed by the American Public Works Association MicroPAVER. MicroPAVER's Pavement Condition Index (PCI) methodology recently received the American Society for Testing and Materials (ASTM) standard D6433-99. MicroPAVER is the only pavement management system to have received an ASTM standard designation. Standard D6433-99 is the only pavement rating methodology recognized for rating streets and parking lot pavements.

Recommendation: The City should evaluate the pavement condition of its streets on a three-year cycle, with 33% of the streets being evaluated each year.

(3.3) The Public Works Department Should Develop Strategies For Addressing The Funding Requirements for Preventive and Corrective Maintenance of the City's Street System.

The Engineering and Traffic Division should evaluate alternatives and develop recommendations for the consideration of the Public Works Director, Mayor and City Council to address the funding requirements required for effective preventive and corrective maintenance of the City's street system. These alternatives should include consideration of:

- An increased allocation of general fund monies focusing first on preventive maintenance of the City's streets and preventing streets from deteriorating to the point where reconstruction is required;
- One-time ad hoc monies that could be used for reconstruction of streets; and

- Using other City-controlled revenue resources for preventive maintenance such as CDBG and redevelopment.

The Engineering and Traffic Division should evaluate these alternatives after it has acquired and installed APWA MicroPAVER and after it has evaluated the pavement condition of at least one-third of the City's streets.

Recommendation: The Engineering and Traffic Division should develop funding strategies for funding the preventive and corrective maintenance requirements of the City's streets.

(3.4) The Public Works Department should expand the extent of non-structural overlays that it uses as preventive maintenance for the City's streets.

When used properly as preventive maintenance, non-structural overlays prevent future cracking by delaying the aging process of the pavement. They can also correct minor flaws such as rutting, raveling, minor cracks, and reduced pavement friction. Certain products, because of their structure, can only be used on low volume traffic roads and the friction aggregate requirements for these treatments reflect this limitation. At present, the City relies on overlays.

These non-structural overlays include:

- **Slurry Seal.** Quick-set slurry is a mixture of asphalt emulsion, aggregate, mineral filler and water. The slurry is continuously mixed and applied to the pavement in a single lift with specialized equipment. There are two aggregate gradations available: Type II and Type III. No compaction is required for quick-set slurry, but the emulsion must be allowed to cure before opening to traffic, usually 2-3 hours. Quick-set slurry will seal the pavement, reducing oxidation and weathering of the surface. The reduction in oxidation will allow the pavement to remain resilient to fatigue and low temperature cracking. Minor surface distresses such as raveling may also be corrected or prevented. The expected surface life for quick-set slurry is 3 to 5 years. It should be used for low volume traffic streets. Type III should be used for streets with higher levels of distress.
- **Chip Seal.** Chip seal has a low to moderate initial cost depending on labor and aggregate sources. Chip seal consists of a heavy asphalt emulsion application followed by a single layer of clean, uniformly sized coarse crushed stone. The emulsion is applied to the cleaned road surface, and immediately covered with

the stone. The stone is placed, producing a dense one aggregate thick layer with no bald spots or bleeding areas. The stones are then oriented and seated with pneumatic tire rollers. The emulsion must be allowed to cure before the road can accept traffic. Surface treatment will seal the pavement, reducing oxidation and weathering of the surface. The reduction in oxidation will allow the pavement to remain resilient to fatigue and low temperature cracking. Minor surface distresses such as raveling may also be corrected or prevented. A good chip seal provides excellent skid resistance and can provide attractive color by choice of stone. The average life is 5 to 8 years. Exceptionally good ones have gone much longer. The 3/8" - 1/2" chip seal is the most common seal coat treatment used in New England.

- **Micro-surfacing.** Micro-surfacing is a mixture of polymer modified asphalt emulsion, aggregate, mineral filler, and water, that has a slurry consistency during mixing and application. The micro-surfacing is continuously mixed and applied with specialized equipment. There are two mix types available based on aggregate gradation: Type II micro-surfacing and Type III micro-surfacing. Micro-surfacing overlays are always applied in two passes. No compaction is required, however, the emulsion must be allowed to cure before traffic is applied. Micro-surfacing will accept traffic within 1 hour after application under most conditions. Micro-surfacing will seal the pavement, reducing oxidation and weathering of the surface. Minor surface distresses such as raveling may also be prevented or corrected. The expected surface life for micro-surfacing is 5 to 7 years. It can be used for high volume traffic streets.

A expanding the types of non-structural overlays utilized by the City of Springfield, the Public Works Department should develop strategies to assure the effective use of these alternatives. Important points to note include the following:

- The alternative treatment approaches should consider the different traffic volume, with lower volume streets receiving longer cycles between surface treatments (e.g., slurry seal) and pavement overlays;
- The cycle chosen needs to be grounded upon the development of strategies that are tied to the pavement condition index for the street.

Recommendation: The Public Works Department should expand the set of non-structural overlays that it utilizes for preventive maintenance of the City's streets beyond overlay to include slurry seal and micro-surfacing.

Recommendation: The Public Works Department should develop strategies to assure the effective use of these alternative non-structural overlays.

4. THE PUBLIC WORKS DEPARTMENT SHOULD IMPROVE THE MANAGEMENT OF THE CAPITAL IMPROVEMENT PROGRAM.

In evaluating the adequacy of the project management practices utilized by the Engineering and Traffic Division, the project team identified several project management principals that should be applied to each phase of the capital improvement project. These standards include the following eight steps that comprise the core project management process:

- Preparation of a project budget;
- Definition of the project, including its scope, staff resources required, project costs, and project priority;
- Establishment of plans and schedules of each capital improvement project to determine that tasks are to be performed internally and by private contractors, as well as the start, end and milestone dates;
- Monitoring and reporting the progress against each element of the schedule for each project;
- Maintenance of the financial control systems necessary to ensure timely reports on current expenditures of funds for each line item of the project;
- Development of a system to alert top management to cost, schedule, legal and other difficulties and unusual circumstances encountered during the course of the project;
- Management of the staff and consulting resources involved in the project in order to adjust to changes in priorities and project mixes as well as to enable completion of the project on schedule and within budget; and
- Management and coordination of the interfaces needed to complete the project.

The review of the Engineering and Traffic Division has identified a number of issues with the approach used by the Division to manage capital projects in accordance with these principles. A number of steps need to be taken by the Division to improve the management of capital projects. These recommended steps are presented below.

(4.1) The Responsibilities for Management of Construction Capital Improvement Projects Should Be Clarified.

The responsibility for managing the City's construction capital improvement projects need to be clearly defined as belonging to the manager of the Engineering and Traffic Division. These responsibilities need to be identified in detail, and the City Engineer held accountable for their delivery. These requirements are described in the text below and in the exhibit following this page.

- **Planning and Organizing the Capital Improvement Program.** Planning of the capital projects is essential to the development of a workable approach to completing these projects on schedule and within budget. Key development requirements for management of the process include the definition of each capital improvement project through the completion of a design authorization form, preparation of a detailed schedule for each project (using Microsoft Project); the preparation of a two-year schedule for the Capital Improvement Program; the projection of staffing requirements to handle planned, prioritized projects; and the "leveling" of these staffing requirements to assure the work does not exceed staff capacity. The client departments would continue to be responsible for preparation of long-term facility master plans such as water/wastewater facility master plans.
- **Project Monitoring and Reporting.** The project manager should be required to assess and report the financial and scheduling status of each project. The project manager should be able to report meaningful information in these status reports. Variances from the planned budget and schedule should be reported via this report as well.
- **Management of Capital Improvement Program Resources.** Management of the Capital Improvement Program process is as much concerned with keeping the project moving after it has started as it is with planning. Management of resources proceeds directly out of the variances identified in the monitoring and reporting phase, and the project manager is concerned with correcting these variances. Key system requirements include defining within the monthly report the steps that need to be taken to restore projects back to schedule, and alerting top management when projects will not be completed on schedule.

Although the specific duties and responsibilities are defined in the exhibit, general goals and objectives for each of the positions within the Engineering and Traffic Division are presented below:

MANAGEMENT REQUIREMENTS FOR PROJECT MANAGEMENT PROCESS

| Component of the Capital Improvement Process | Requirement | Responsibility |
|---|--|--|
| Planning and Organizing the CIP Upon Mayor and Council Approval | Preparation of a design authorization form for each CIP project to define the financing, description, scope, design considerations, and the necessary coordination with outside agencies such as the Massachusetts Highway Department This process should also include an indication of whether an environmental evaluation is required and right of way acquired, as well as a determination of staffing requirements based on application of percent of construction guidelines, or others as developed by the Division. | Project Managers |
| | Preparation of a network schedule using Microsoft Project for each project, including duration time for each task, and earliest and latest start and final times. | Project Managers |
| | Preparation of bar chart schedules for the entire CIP for a 2-year period showing projected timing of planned projects by major project component (e.g., design, bid, award, construction, etc.) | City Engineer |
| | Projection of staffing requirements to handle planned, prioritized projects for next fiscal year, including workload loading on a monthly basis. | City Engineer |
| | Leveling of resources to enable the development of schedules based on available staffing and other resources. | City Engineer |
| Project Monitoring and Reporting | Reporting via the legacy financial and human resource information system the actual staff-hours by position type on CIP projects to provide the basis for: <ul style="list-style-type: none"> Monitoring of staff and contractor performance against guidelines during each phase of the process. Monitoring actual versus projected staff needs. Development of a database to utilize in refining project workload estimates. | Project Managers, Construction Inspectors |
| | Reporting of project status on a monthly basis, including status of staff hours planned vs. actual. Reporting of financial status of each project showing expenditures to date versus the plan. | Project Managers City Engineer |

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| Component of the Capital Improvement Process | Requirement | Responsibility |
|---|---|---|
| Management of the CIP Project Resources | Recommending within the monthly status report steps that can be taken to enable completion of projects on schedule. Communication to top management within the monthly status report of CIP projects that will not be completed on schedule and within budget, along with estimated completion dates for each of these projects. | Project Managers and City Engineer City Engineer |

- The City Engineer should be held accountable for delivering Capital Improvement Program projects on schedule and within budget, and for managing the Capital Improvement Program process, including planning and scoping of all capital improvement projects.
- The staff within the Engineering and Traffic Division that are assigned as project managers (including those staff assigned to the design of projects) should be held accountable for the effectiveness of the project management of capital projects to which they have been assigned. Further, they should be held accountable for monitoring the planned versus actual schedule and budget for their assigned projects, including:
 - Implementing initiatives to accomplish Capital Improvement Program projects on schedule and within budget;
 - Working with management to defining and securing the staff resources needed for the project;
 - Assuring that all project plans and schedules are defined as part of the planning and scoping of a capital project prior to commencement of design;
 - Monitoring and reporting progress and problems in meeting capital project plans and schedules; and
 - Managing and coordinating interfaces between various staff of the Division and other departments in the City including the client department.

The individual project manager from the beginning of the project to its final conclusion should fulfill the responsibilities listed above. This is a concept of “cradle to grave” project.

- The Engineering and Traffic Division should be responsible for planning and scoping of the capital improvement project, and not the client department. This would be accomplished through a design authorization form as noted within the next recommendation.

The size of the capital improvement program within the City of Springfield has not been substantial. The methods used to manage the capital improvement program have benefit to this size and scope. However, the infrastructure needs of the City are significant, and the sophistication of the management of capital projects used to

address those needs, including management of capital projects, need to be adjusted accordingly.

Recommendation: responsibilities for managing the capital improvement program by the Engineering and Traffic Division should be clarified.

(4.2) A Summarized Twenty-Four Month Bar Chart Schedule Should Be Prepared For All Capital Projects That Will Be Designed and Inspected by the Engineering and Traffic Division.

This schedule should portray start and finish dates for each capital project by simple activity descriptions for design, bid package preparation, advertise/award, right-of-way acquisition, environmental impact evaluation, and construction. This schedule should be prepared for all capital projects that will be assigned to the Engineering and Traffic Division during the next twenty-four months based upon the five-year capital improvement program.

Recommendation: A twenty-four month bar chart schedule should be prepared for all capital projects that will be designed and scheduled by the Engineering and Traffic Division.

(4.3) A Design Authorization Form Should Be Completed Before Commencement of Design.

Only the manager of the City Engineer should authorize the initiation of design of a capital project before its commencement. Design of a project should not be initiated until the resources required (staff hours and construction funding) for completing the project have been identified using the design authorization form. The design authorization form should include the components enumerated below.

- The project title including the phase of the project, if relevant.
- A general project description including a narrative summary description of the project, specific physical improvements included, the location of the project, and the relationship to master plans.

- The capital project number (as noted in the five year capital improvement program).
- The financing and the cost including the source of funds, and the appropriation status.
- A budget covering the project management or design staffing, survey staffing, construction inspection staffing, appropriate consultants, property acquisition, utility relocation, etc., by major expenditure component.
- The responsibility for completing the various components of the capital project including the following:
 - Design by in-house staff or by consulting engineer;
 - Construction inspection by in-house staff or by consulting engineer;
 - Design survey and construction staking by in-house staff or consulting engineer;
 - Environmental evaluation required;
 - Right-of-way acquisition required and, if so, the number of parcels and their locations and assessor parcel numbers;
 - Utility relocations that need to be relocated, problems with relocation and timing issues; and
 - Other key responsibilities that need to be assigned and/or accomplished.
- The extent of coordination necessary, listing the inter-agency coordination by division, department, or outside agency with whom coordination will be required in the design and construction of the capital project, the nature of the coordination, and the key contacts;
- The preliminary schedule for completing the design and construction of the capital project including the schedule for design, bid package preparation, advertise/award, right-of-way acquisition, environmental impact reports, and construction and including the dates of important events such as approval of the award of construction contract by the City Council;
- A change order procedure that includes a documented, systematic approach to the handling of construction change orders;

- Staffing levels required throughout the design and construction phase, including the estimated staffing required in terms of person hours required for design and construction inspection utilizing the cost of construction guidelines;
- Materials testing policies and procedures;
- Design and construction reporting requirements, including cost and schedule control procedures;
- Design considerations or issues related to the capital project such as complexities of the design; and
- Community relation and public information requirements including public hearings or meetings and how the public will be informed and involved in the preliminary design and informed about the progress of the design and construction.

Recommendation: A design authorization form should be completed before commencement of design.

(4.4) Costs of Construction Guidelines Should Be Utilized to Document Resource Requirements for the Design and Inspection of Capital Improvement Projects.

The exhibit presented following this page presents an example of guidelines for the design and inspection of capital improvement projects as a percentage of construction. These guidelines have been developed based upon data developed by the project team Percentage of construction cost “has been widely used for determining the compensation of consulting engineers on assignments where the principal responsibility is the design of various works, and the preparation of drawings, specifications, and other contract documents as necessary. The following points should be noted concerning this cost of construction guideline.

- Two different levels of complexity are noted: average and above average. An above average level of complexity should be based upon the need to deal with other agencies (e.g., Massachusetts Department of Highways), the design complexities of the project, or problems with planning and construction determining the compensation of consulting engineers on assignments where the

Allocation of Staff Resources for Design and Inspection As A Median Percentage of Net Construction Costs

| Type of Project | Street Construction | | | | Street Reconstruction | | | | Traffic Control | | Water and Wastewater | | | |
|-------------------------|---------------------|-------------|----------------|-------------|-----------------------|-------------|----------------|-------------|-----------------|-------------|----------------------|-------------|----------------|-------------|
| Level of Complexity | Above Average | | Average | | Above Average | | Above Average | | Average | | Above Average | | Average | |
| Construction Cost (+/-) | \$0.25 million | \$1 million | \$0.25 million | \$1 million | \$0.25 million | \$1 million | \$0.25 million | \$1 million | \$0.25 million | \$1 million | \$0.25 million | \$1 million | \$0.25 million | \$1 million |
| Planning and Scoping | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% |
| Design Development | 10% | 8% | 9% | 7% | 13% | 11% | 10% | 8% | 8% | 6% | 9% | 8% | 8% | 6% |
| Design Survey | 1 ½% | 1% | 1 ½% | 1% | 1 ½% | 1% | 1% | ½% | 1 ½% | ½% | 1% | ½% | 1% | ½% |
| Design Administration | 2% | 2% | 1 ½% | 1 ½% | 2% | 2% | 1 ½% | 1 ½% | 1 ½% | 1 ½% | 1 ½% | 1 ½% | 1 ½% | 1 ½% |
| Construction Survey | 3% | 2 ½% | 2 ½% | 2% | 2% | 1 ½% | 1 ½% | 1% | 0.1% | 0.1% | 2 ½% | 2% | 2 ½% | 2% |
| Construction Inspection | 5% | 5% | 4% | 4% | 5% | 5% | 4% | 4% | 3% | 3% | 4% | 4% | 4% | 4% |
| Construction Management | 3% | 3% | 2% | 2% | 3% | 3% | 1 ½% | 1 ½% | 2% | 2% | 3% | 3% | 2% | 2% |
| Project Closure | 0.4% | 0.1% | 0.4% | 0.1% | 0.4% | 0.1% | 0.4% | 0.1% | 0.4% | 0.1% | 0.4% | 0.1% | 0.4% | 0.1% |
| Total | 25.4% | 22.1% | 21.4% | 18.1% | 27.4% | 24.1% | 20.4% | 17.1% | 17% | 13.7% | 21.9% | 19.6% | 19.9% | 16.6% |

principal responsibility is the design of various works, and the preparation of drawings, specifications, and other contract documents as necessary.

- These guidelines are customized to fit the different types of construction jobs such as street construction, street reconstruction, traffic control, water and sewer, etc.
- These guidelines were developed to “fit” the different types of work activities in each capital project. These include planning and scoping, design development, design survey, design administration, construction survey, construction inspection, construction management, and project closure.
- The guidelines are expressed as a percentage of construction (e.g., the cost of staffing as a percentage of construction). To determine the number of staff hours required, divide the cost of the work activity based upon the cost of construction guidelines by the current hourly cost of a consulting engineer for engineering work activities. Use of the hourly cost for a consulting engineer will level the playing field and ensure that the City’s staff are every bit as productive and held accountable as consulting engineers.
- The guidelines identify resource requirements for each work activity associated with a project. These include design development, design survey, design administration, etc.
- If a consulting engineer is accomplishing the design, the project manager in the Engineering and Traffic Division would utilize the guideline for design administration, and not design development.

The section managers within the Division should determine the staffing requirements for each project in terms of person hours required for design and construction inspection utilizing the cost of construction guidelines. The City Engineer should customize these costs of construction guidelines. The cost of construction guidelines should not be “blindly” utilized. These guidelines are just that: guidelines. The guidelines will need to be adjusted to the local circumstances.

Recommendation: Cost of construction guidelines should be utilized to determine the engineering staffing requirements for each capital improvement program project in terms of person hours required for design and construction inspection.

(4.5) Prepare a Monthly Capital Project Status Report.

The Engineering and Traffic Division should prepare a monthly narrative statement regarding each capital project no later than the fifth working day of the month.

The following information should be included in this status report.

- Capital project number (based upon the number assigned in the six year capital improvement program);
- The capital project name;
- The project manager or construction inspector assigned to the project (or the consulting engineer);
- A comparison of actual project costs to date versus planned including
 - Design budget;
 - Design expenditures to date separately identifying staff expenditures from consulting expenditures;
 - Construction management expenditures to date separately identifying contract administration, construction inspection, and consulting engineering expenses;
 - Construction cost as budgeted; and
 - Current construction cost as estimated by the project manager responsible for construction management.
- A comparison of actual project schedule to date versus planned including:
 - The date the design was scheduled to begin and actually begun;
 - The date the design was scheduled to finish and actually finished;
 - The date the City Council was scheduled to award a contract for the construction versus the actual (or new estimated date);
 - The date the construction was scheduled to begin and actually begun; and
 - The date the construction was scheduled to finish and actually finished.

- The current status of the capital project containing explanations such as 30% design complete.

These should be simple reports. The Public Works Department should publish these reports monthly, on-line on the Internet.

Recommendation: The Engineering and Traffic Division should prepare a monthly narrative statement regarding each capital project no later than the fifth working day of the month.

Recommendation: The Public Works Department should publish these reports monthly, on-line on the Internet.

(4.6) A Final Report Should Be Prepared on Completion of a Capital Project.

Without a formal analysis and distribution for review, the mistakes and weaknesses of one project will almost certainly be repeated on others. The final report should focus on analyzing the good and bad aspects of the completed project, transmitting that information to the staff of the Engineering and Traffic Division, and providing a convenient summary of the project.

At the completion of the project, the project manager assigned to the project should complete a final report including:

- Project name, project number, and a description of the project. Construction costs – planned versus actual with an identification of all of the change orders and the reasons for those change orders;
- The staff hours allocated to the project - planned versus actual;
- The schedule for completion of the project - planned versus actual including whether drawings, specifications, schedules, and cost estimates were prepared consistently according to schedule;
- The design costs for the project - planned and actual including cost per sheet;
- Construction management costs - planned versus actual;
- Whether as-built plans have been completed;

- Whether the project at completion met the value expectations of the client including a customer satisfaction survey completed by the client that identifies such issues as construction cost versus value, responsiveness to the client, ease of maintenance, usability, and the like; and
- Comments and discussion regarding the project as necessary including unusual conditions encountered during the project such as contractor deficiency, quantity difference, scope change, etc.

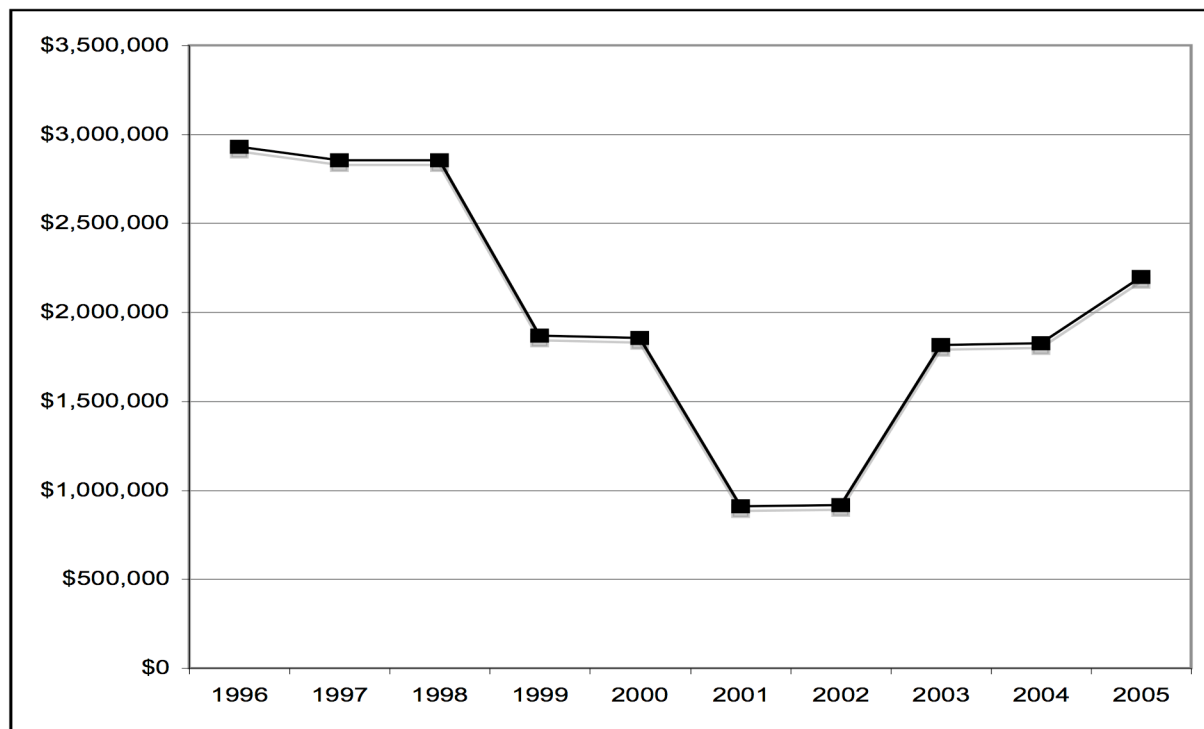
This report should be circulated to the other project managers, the City Engineer, the manager for the Capital Projects Section, the Public Works Director, and the client department. After distribution of this status report, it should be the basis of a meeting with the client department.

Recommendation: The Public Works Department should complete a formal analysis of the good and bad aspects of the completed capital improvement project.

5. THE CITY SHOULD ACCEPT THE PRIVATE ROADS THAT HAVE BEEN PAVED WITHIN THE CITY IF THE ROADS ARE IN FAIR OR BETTER CONDITION.

The City's Chapter 90 funding has varied significantly over the past ten years as the chart below indicates. Overall, the Chapter 90 funding received by the City over the past ten years has varied from a high of \$2,930,113 in 1996 to a low of \$908,649 in 2001. In 2005, the funding amounts to \$2,199,663. Over the past ten years, the City has averaged annually Chapter 90 funding in the amount of \$2,002,855. This is the primary source of funding for the City's overlay and street rehabilitation program.

The table below presents the year-by-year trend in Chapter 90 funding received by the City of Springfield.



An alternative for the City to increase its Chapter 90 funding is to accept privately paved streets. The City has a total of 372.63 centerline miles of City streets. There are, in addition, 85.66 miles of privately-owned and paved streets as well. The City is already maintaining much of these privately-owned private streets in response to complaints. In addition, the City has historically allocated funding for private way conversions. In 2005, the funding amounts to \$200,000.

The City's allocation of Chapter 90 funding in 2005 amounts to \$2,199,663. This amounts to \$5,900 per centerline mile. If the City accepted the privately-owned paved streets, the City could potentially increase its Chapter 90 funding by \$505,657 or 23%. Before accepting these roads, the Engineering Division should evaluate each road to evaluate the pavement condition to determine the costs of upgrading these roads to acceptable condition. In evaluating the condition of these roads, the following data should be collected.

- Street Name
- From and To - Identify road (connecting streets) found at its start and end (if any).
- Length - Record odometer reading to nearest 1/10 mile.
- Width - Pace the width of the traveled way and record to the nearest "yard". For lengthy roads, several sections should be paced to determine an average width.
- Road Surface - Identify dirt or gravel roads as "dirt" and treated or paved roads as "treated" for each surface type on each road.
- Housing Factor - Use the following factors for various housing conditions:
 - Fifteen houses or less
 - More than 15 but not exceeding 30
 - More than 30 but not exceeding 45
 - More than 45
- Artery Factor - Identify the road using one of the following descriptions:
 - Minor Residential - Road provides access to houses primarily on that street.
 - Residential Collector - Road feeds into "subdivision" providing primary access to houses on other streets.
 - Through Connector - Road serves as primary connector between two major roads.
- Surface Factor - Identify the road surface condition using the following factors:
 - Very Good - Road surface generally smooth, can travel at legal speed without damage or loss of control.
 - Good - Road surface somewhat rough, can travel at legal speed with moderate care.
 - Fair - Road surface rough in many locations, can travel at slightly below legal speed with moderate care.
 - Poor - Road surface rough in many locations, can travel only at speeds

substantially below legal limit.

- Very Poor - Road surface very rough throughout, travel on road must be very slow and erratic to avoid damage or loss of control

Recommendation: The Engineering Division should conduct an evaluation of private roads to assess their condition.

Recommendation: The City should accept those private roads that are in fair to very good condition and that meet the width requirements of the zoning ordinance.

6. THE PUBLIC WORKS DEPARTMENT SHOULD CHARGE FEES FOR PLAN CHECKING OF DEVELOPMENT REVIEW APPLICATIONS AND CONSTRUCTION INSPECTION OF DEVELOPMENT RELATED INFRASTRUCTURE.

The Public Works Department dedicates an Assistant Civil Engineer to the plan checking of development review applications including definitive subdivision plans, site plan reviews, and minor modifications. Plan checks for conformance to standard specifications including water and sewer. During the 30 months from June 2002 through December 2004, the Assistant Civil Engineer completed 60 major site plan reviews (with an additional 10 pending review), 13 subdivision reviews, and 13 sanitary sewer extensions.

The Public Works Department does charge approximately one-half of the available work hours of this Assistant Civil Engineer to the Water and Sewer Commission. However, the department does not charge any fees to the development review applicant for the processing of the application.

A review of other cities in Massachusetts found that these fees are not unusual.

For example, one city charged the following fees:

- Preliminary Subdivision Plan \$200.00 filing fee plus \$1.00 per linear foot of proposed roadway. Plus \$100.00 for advertising for public hearing, if held. Plus mailing costs. To be paid at the time of plan submission.

- Definitive Subdivision Plan. \$500.00 filing fee plus \$2.00 per linear foot of proposed roadway less 80 percent (80%) of all fees paid for preliminary subdivision plan if filed within seven (7) months of filing of preliminary plan. Plus \$100.00 for advertising for required public hearing. Plus mailing costs. To be paid at the time of plan submission.
- Changes to subdivision plan subsequent to approval. \$200.00 filing fee. \$100.00 advertising for public hearing, if any. Plus mailing costs. To be paid at the time of plan submission.
- Inspection of Subdivision Construction. \$50.00 plus \$1.00 per linear foot of proposed roadway. To be paid after approval of subdivision plan and expiration of appeal period, but prior to signing of Definitive Plans.

The Public Works Department should document the number of staff hours required to process a definitive subdivision review, a site plan review, minor modifications, etc., and establish fees for each different type of application based upon the hourly rate and fringe benefit costs of the Assistant Civil Engineer.

Recommendation: The Public Works Department should charge fees for the plan checking of definitive subdivision review, a site plan review, minor modifications, and other types of development review applications.

7. THE PLANNING DEPARTMENT SHOULD RECEIVE INITIAL SUBMITTAL OF SUBDIVISION AND ZONING PERMITS, AND BE THE LEAD DEPARTMENT FOR THE REVIEW AND CONDITIONAL APPROVAL OF THESE PERMITS.

Under the existing approach, applicants submit definitive subdivision review, a site plan review, minor modifications, etc., applications directly to the Engineering Division.

While this process for submittal of development services does not prevent the City's ability to achieve responsive customer service goals, it does hinder the City's ability to achieve those goals. It can generate a number of problems for customer service, some of them potentially serious.

- **The Engineering Division could potentially approve a site plan review, with conditions, in instances in which the proposed use does not conform to the zoning ordinance or the general plan.** The Assistant Civil Engineer may or may not contact the Planning Department. In any case, the conditions of approval are not routed to the Planning Department. The Engineering Division is functioning as a “silo” in this development review process.
- **Under the current plan of organization, many of the problems with development review applications could require the personal intervention of the Mayor.** This includes linking together key development services that cut across departmental lines or resolving disagreements between departments over such issues as conditions of approval. Yet the Mayor has little time to dedicate to this coordinating role given other demands on his time.
- **The existing organizational structure does not support the City’s top priorities.** Economic vitality has been one of the top priorities of the City. Economic vitality requires that the City be easy for the customer to do business with. The development processes utilized by the City are cumbersome and do not facilitate customer friendly service.
- **The process utilized for development services consists of “silos” that force the customer to do the work.** The process utilized for development review is made up of different departments or “silos” each with a role in the development review process.

The Planning Department should be assigned responsibility for being the team leader in the processing of zoning and subdivision permits. The responsibilities that the Planning Department would need to exercise in fulfilling this responsibility are identified in the paragraphs below.

- Being the “one stop shop” for the submittal of zoning and subdivision permits by applicants;
- Collecting and integrating comments and conditions of approval from other departments;
- Resolving inter-departmental problems such as conflicting conditions;
- Assuring that other departmental conditions of approval or requirements are appropriate;
- Working with the applicant to resolve problems and revise the project as appropriate;

- Changing from a regulator and collector of other's opinions to a problem solver that is focused on how to get the job done and build a better community;
- Functioning as an advocate for the process (maintaining timelines and seeing that they are met);
- Promptly reviewing and issuing notifications of omissions or problems with the project; and
- Coordinating with key decision makers.

In summary, the Planning Department would function as team leaders for a multi-disciplinary team. The department would be responsible for keeping the review of zoning and subdivision permit plans on track, making sure issues involving conflicting code or regulatory issues are resolved, charting a clear course for the applicant through the plan check process, and making sure issues regarding the application are identified early in the plan check process.

The exercise of this responsibility needs to be authorized in a policy adopted by the mayor.

Recommendation: The Planning Department should assume responsibility as the lead department in the review and conditional approval of zoning and subdivision permits.

8. APPLICATION GUIDES SHOULD BE DEVELOPED FOR THE ZONING AND SUBDIVISION PERMITS PROCESSED BY THE ENGINEERING DIVISION.

The Engineering Division should develop application guides for preliminary subdivision review, definitive subdivision review, site plan review, minor modifications, etc. These guides should identify the minimum requirements for an application to be deemed complete, a checklist of submittal requirements that an applicant has to check off and that requires the applicant's signature. This is designed to have the applicant self-certify the application includes all of the information required to achieve a complete

submittal. The application guides developed should include storm water best management practices. These application guides should be available both at the counter and published at the web site for the Public Works Department.

Recommendation: The City Engineer should develop application guides for preliminary subdivision review, definitive subdivision review, site plan review, minor modifications, etc.

9. THE ENGINEERING DIVISION SHOULD PUBLISH THE STANDARD CONDITIONS FOR DEVELOPMENT APPLICATIONS AT THE PUBLIC WORKS DEPARTMENT WEB SITE.

The Engineering Division has developed standard conditions for the approval of development applications. For example, the division has developed site plan requirements for a site plan review. These include requirements, for example, that the plan must be prepared, stamped, and signed by a Massachusetts Registered Professional Civil Engineer. These standard conditions should be published at the Public Works Department web site to make this information readily accessible for applicants.

Recommendation: The Engineering and Traffic Division should publish their standard conditions of approval on the Public Works Department web site.

10. THE PROCESS UTILIZED FOR PROCESSING LOT SPLITS AND CONSOLIDATIONS SHOULD BE REENGINEERED TO UTILIZE GIS.

The Engineering Division allocates an Assistant Civil Engineer to the processing of lot splits or consolidations from the Assessor's Office, assuring that the deed matches the survey plan from the Registry, assuring the survey points close and the lot square footage is accurate, and updating the property lines on vellum, makes 2 copies of the vellum – one for the Assessor's Office and the other for the Public Works Department. The Assistant Civil Engineer allocates an estimated 60% to 70% of his available work

hours to this activity, processing approximately 80 to 100 of these applications annually.

This process should be reengineered to leverage the City's investment in GIS. These property lines should not be made on vellum. These adjustments to property lines should be made in GIS. The Engineering Division should not be involved in making these updates and maintaining the parcel layer in GIS; this should be the responsibility of the Assessor's Office.

Recommendation: The processing of deeds for lot splits and consolidations from the Assessor's Office should be reengineered so that adjustments to property lines are made in GIS and not on vellum.

Recommendation: The Assessor's Office should be responsible for processing of deeds and updating property lines in GIS resulting from lot splits and consolidations.

11. THE CITY SHOULD ACQUIRE AN AUTOMATED PERMIT INFORMATION SYSTEM.

Permitting software has changed the way communities do business, speeding the permit process for the people most involved – applicants, contractors, neighborhoods, and staff - and providing better and more timely information to decision-makers, managers, and staff throughout city hall and the communities.

Initiated by a few pioneering jurisdictions in the early 1980s, permitting software has become mainstream. Software vendors offer a variety of permitting software and systems that can be tailored to a jurisdiction's needs. Many can be integrated into larger, citywide information technology systems such as ArcInfo. Progressive local governments have adopted permitting software.

Regardless of the catalyst for change, permitting software can provide a broad range of benefits, including:

- Standardized building site and parcel information;

- Improved record keeping and reliable archiving of permitting activities;
- Enhanced communication between customer and staff that produces higher quality plan submissions and reviews, permit applications, and customer service;
- Defined workflow and project tracking that results in more timely review of plans and permits;
- Higher quality inspections (since the inspectors can readily retrieve conditions of approval associated with discretionary permits) with better scheduling and improved reporting;
- More efficient use of staff time and less duplication of effort;
- Better internal management tools for gauging permitting efficiency and service levels and spotting problems;
- Improved financial tracking of permitting, plan review, and inspection fees; and
- Flexible reporting capabilities that document the volume of work completed and the revenue generated by the departments/divisions involved in the permit, plan check, inspection, and code enforcement process.

However, the investment that a city makes in permitting software can only be worthwhile if the software itself is effectively utilized.

The automated permit information system should be designed to serve all of the City's staff and outside agencies involved in the City's permitting process. This includes:

- Planning Department;
- Public Works Department;
- Code Enforcement;
- Fire Department;
- Health and Human Services Department.

The system should serve a number of purposes including the following:

(11.1) Utilize the Permit Software to Manage the Permit Process.

Complex permits should be routed to several individuals at various divisions and

departments in Springfield to provide the applicant with full and comprehensive feedback regarding conditions of approval and to provide a “one stop shop” for the applicant.. Automating the permit process means that the permit will not sit on a desk too long or get misplaced as it is being reviewed.

Workflow within permitting software would allow the City of Springfield to automate its routing processes among the various divisions and departments. For example, when Planning receives a permit application, these tools automatically route the application to the next functional unit such as the Conservation Commission. Workflow tools can route documents either in serial or parallel sequence to eliminate float time, (the time it takes to transfer the document between divisions/departments), automatically notifies divisions/departments of pending work, and automatically makes decisions based on established business rules.

Workflow tools can also support communication between the Springfield and the architect, contractor, or permit applicant. For example, a construction professional applies for a permit and waits for the results. Traditionally, they cannot begin to resolve problems until the permit application has made its rounds. With an integrated workflow, the construction professional learns about a problem when it is identified by each division or department and can begin to resolve the issue immediately. Through the use of automated routing and standard data exchange formats, construction professionals and Springfield can integrate their processes and exchange project-related information in real-time, over the Internet. (There is some risk to the applicant in responding to these corrections piecemeal; corrections could potentially conflict with each other. The consolidation of these corrections was an element of previous improvements. But this

was a service that some customers identified as desirable in the focus groups.).

In utilizing workflow aspect of the permitting software for the permit, plan check, and inspection process, the City would take the steps identified below:

- Identify workflow coordinators for the various processes such as building permit plan check in Code Enforcement, discretionary permit plan check in Planning, etc. and utilize this group to coordinate the installation of workflow and represent their division or department;
- Utilize the group to define workflow details including mapping the permit, plan check, and inspection process;
- Managers for the permit, plan check, and inspection process should define timelines for the various permits; and
- Test the workflow.

Workflow aspects of the permitting software automate the routing of permits and enable the City to manage the process based upon procedures established by the City. It can record personnel assignments and monitor turnaround time. Tracking software follows the project from the initial application to the certificate of occupancy and records when project documents entered the system, how long they took to be processed, and their current standing. Workflow software links the project to the history of the property held in the database.

(11.2) All of the Departments Involved in the Issuance of Permits Tied to An Address or Parcel Number Should Utilize the Permitting Software to Meet All of their Permit Requirements.

The City will make an important investment in permitting software. The permitting software will be capable of a broad range of tasks including the following:

- Plan review tracking;
- Permitting including the issuance and tracking of permits;
- Inspections scheduling and tracking;

- Workflow management;
- Fee calculation and collection;
- Customer communications through web-based customer services;
- Telephone-based voice response services; and
- Inter- and intra-departmental communication and management.

All of the divisions and departments that issue substantive numbers of permits on behalf of the City that are tied to a property address or assessor parcel number divisions need to utilize Permits Plus for all aspects of the permit, plan check, and inspection process.

(11.3) Plan Check and Permit Annotations, Corrections, and Comments Should Be Stored in the Permitting Software Database.

Once permits are plan checked, annotations and comments can be added to the permitting software, shared among the review team, and forwarded to the applicant. This is an essential element of permitting software: to facilitate collaboration, integration, and cooperation among staff, applicants, architects, and the neighborhoods. Use of the permitting software for these annotations and comments provides the potential for 24/7 access to staff, applicants, architects, and the neighborhoods.

(11.4) Staff Reports and Application Plans Should Be Stored in the Permit Software Database.

Document management tools within permitting software offer the capacity to transform paper documents into digital documents and files, allowing staff to store, manage, and access documents and applicants and the public to access these documents using a standard interface. Using these document management tools, any information associated with the permit process is digital and indexed to the permit

application. In addition to the electronic documents that can be stored in permitting software, hard copy documents, photos and drawings can be scanned and converted to digital files. Cities are beginning to integrate document management tools into their permit processes because this technology improves the linkages between related information and provides a single point of access to multiple sources of permit information.

The City should use a number of approaches to accomplish this goal. These approaches are presented in the paragraphs below.

- **All documents created by staff regarding permits, plan checks, and inspections should be archived in the permitting software so that they can be stored and located more easily and efficiently.** The permitting software will have the capacity to store electronic documents (such as those created by Microsoft Word or Excel), legacy documents imaged or scanned from paper or microfiche, and documents and images from databases. In addition, city staff can scan non-electronic documents to add them to the document management database.
- **The City should scan plans submitted to the City.** The City should accomplish this through a document imaging fee. This is not an uncommon approach. Other cities and counties have already taken this step.
- **Plans that are scanned should be archived in the permitting software database.** All plans should be labeled and archived for future reference. There are a number of public agencies that are not only archiving these architectural plans, but also receiving these plans from applicants over the Internet.

(11.5) Applicants should be provided with the ability to obtain simple building permits on-line using the permitting software.

Permits that do not require a plan check, such as single trade permits, often known as over-the-counter permits, are well suited to online permit processing. Similar to e-commerce transactions, such as buying products from a Web site, this activity involves credit card processing and the printing of a permit. On-line processing of permit applications can be as basic as automating only the front-end information collection

process or as complete as full automation of the entire over-the-counter permit transaction.

At their own personal computer, applicants can apply for a building permit, schedule an inspection, and print the permit and receipt. Credit card payments are secured through the use of encryption technology. Applicants can setup their access so that basic information does not need to be re-entered for multiple transactions.

Permitting software provides the capacity for applicants to complete a permit application via the Internet. Applicants complete online forms and hit a “send” button to transmit the application to the City’s permit database. The permitting software processes, reviews, approves, and stores completed permits. The permit system then generates a permit for the applicant. Applicants can pay for permits using a credit card.

There are a number of public agencies throughout the United States that are using this capacity within permitting software. These cities range from Albany, Oregon to Miami-Dade County, Florida to Alameda, California.

The City should implement this feature within the permitting software for simple building permits including the full automation of the entire over-the-counter permit transaction. Initially, this would include only single trades permits such as plumbing, mechanical, and electrical permits. Longer-term, this should be expanded to other types of permits such as re-roof permits.

(11.6) The public and applicants should be provided with access to the permitting software over the internet.

Permitting software provides the capacity for the public and for applicants to access the permitting software through the Internet. This capacity would make information from the City’s permit database accessible via the Internet by permit

applicants, residents, and other interested parties. In this instance, the City's Web site would provide a search form where citizens enter a property address or permit number to receive current information on that permit, 24 hours a day, seven days a week, from any computer with Internet access. The City can control the amount of information that is accessible by the public and can limit the amount of users by incorporating password protection, if it chooses to do so.

This feature should be utilized to enable applicants to check the status of their permits. Giving applicants the ability to check the status online reduces telephone and walk-in traffic and allows applicants and city residents to review this information even when City Hall is closed.

It should also be utilized to enable citizens to review proposed projects online. By placing information about proposed developments on the Web, citizens have increased opportunity to participate in planning the City.

Overland Park, Kansas, for example, enables citizens to access development activity in their neighborhood through a marriage of their permitting software and geographical information system. The City's Web site contains "What's Happening In My Neighborhood." The site lets users enter their home address and desired search radius, to retrieve listings of all active Planning Commission cases, special event permits, building permits, and Public Works projects. Users can click on each case number for more detail from the permit system, and click further to send email and comments directly to the case planner for the permit application.

The cost of the system, in terms of software, installation assistance, and training, should approximate \$60,000, and \$15,000 in ongoing licensing costs.

Recommendation: The City should acquire an automated permit information system.

12. STAFFING FOR THE ENGINEERING AND TRAFFIC DIVISION SHOULD BE ADJUSTED.

The Engineering and Traffic Division is authorized 41 positions; 13 of these positions are vacant at the present time. This includes 7 positions in Engineering and 6 positions in Traffic. This includes field maintenance positions such as Skilled Laborer as well as Junior Civil Engineer.

There are a number of factors to consider in evaluating the staffing levels in the Engineering and Traffic Division. These factors include the following:

- The level of staffing for traffic engineering, currently just a Junior Civil Engineer, which is inadequate for a City the size of Springfield;
- The Conservation Commission staffing, which has recently been assigned to the Engineering Division;
- The staffing for the Board of Public Works, currently a Principal Civil Engineer;
- The extent of capital project funding that the Division will be responsible for the design and construction management and the staffing required for design and construction management; and
- The extent of development that the Division will plan check and inspect.

While there are a number of factors that need to be considered, the level of staffing within the Engineering and Traffic Division exceeds current workload. The evaluation of the staffing levels required for the Division is presented below.

(12.1) The Principal Civil Engineer Position Allocated to the Board of Public Works Should Be Eliminated, and Instead Staff From the Engineering and Traffic Division Should Provide Support to the Board of Public Works.

This position is responsible for a number of services including the following:

- Acceptance of Public Ways with 36 pending applications, but typically 8 applications a year;

- Alteration widening and relocation of public ways with 1 application every two years, if that;
- Discontinuance of public ways and private ways with approximately 2 applications a year;
- Temporary repairs to private ways with no applications received over the past six years;
- New sanitary and storm drains with 1 application every two years;
- Abandonment of storm drains with 1 application every two years;
- Establishing and reestablishing sidewalks with no applications in the past three years;
- Eminent domain for highways and drains with no applications over the past several years;
- Recommending land damages with the use of a consultant to appraise the value of the lands;
- Calculation of betterment assessments with no betterment assessments in 2004-05 to date; and
- Utility company petitions to relocate a pole, manhole, transformer into the public right-of-way with approximately 2 applications a week.

This is insufficient workload to warrant a full-time position. The Principal Civil Engineer position should be eliminated. This workload should be assigned to the Assistant Civil Engineer assigned to development review. During the 30 months from June 2002 through December 2004, the Assistant Civil Engineer completed 60 major site plan reviews (with an additional 10 pending review), 13 subdivision reviews, and 13 sanitary sewer extensions. This is equivalent to almost 3 plan checks a month. The Assistant Civil Engineer can absorb the additional workload associated with the Board of Public Works.

Recommendation: The Principal Civil Engineer position allocated to the Board of

Public Works should be eliminated.

Recommendation: The Assistant Civil Engineer allocated to development review should absorb the workload associated with the Board of Public Works.

(12.2) Five Engineers and Technicians Should Be Authorized For Traffic Engineering.

The Engineering and Traffic Division allocates only one position to traffic engineering at present: a Junior Civil Engineer. There are a number of indications that the staffing within the Engineering and Traffic Division for traffic engineering is inadequate. More specifically:

- Relative to other comparable metropolitan agencies, the extent of traffic engineering staff within the Engineering and Traffic Engineering Division is at the lower end of the range. There is a total of one filled traffic-engineering position – a Junior Civil Engineer - within the Engineering and Traffic Division or 0.7 staff per 100,000 population. This is comparable to the lower end of the range of all other agencies participating in the report issued by the Institute of Transportation Engineers: Status and Effectiveness of Urban Traffic Engineering Agencies. The average for the twenty-nine agencies with a population of 100,000 to 250,000 was 7.8 professionals and technicians per 100,000 population, or 11 times greater than Springfield.
- The report issued by the Institute of Transportation Engineers: Status and Effectiveness of Urban Traffic Engineering Agencies reported that the minimum number of staff needed to function effectively for agencies with a population of 100,000 to 250,000 was 3.2 per 100,000 population. This would indicate that the Public Works Department would need almost five traffic engineering professional and technical positions.
- The City of Worcester is authorized four professional traffic engineering positions in fiscal year 2004-05 (but no traffic technician positions). Two other professional positions are authorized, but not funded.
- A comprehensive traffic engineering program has not been developed to enhance the movement of traffic throughout the City and enhance traffic safety. The gaps are presented in the paragraphs below.
 - **Existing levels of service have not been identified for arterial streets.** These levels of service identify the performance of the street in terms of traffic congestion and travel time delay. These serve to identify those intersections that are the highest priority for traffic system management

measures that would reduce traffic congestion and travel time delay. These existing levels of service would include peak hour turning movements and average daily traffic volume map for arterial streets.

- **A traffic safety program is not in place to analyze high accident intersections and develop mitigation measures.** The identification and surveillance of high-accident intersections is one of the most important aspects of a traffic engineering program. The program consists of actively seeking out hazardous locations, analyzing them to see if engineering measures may improve the situation, and, if so, designing the engineering measures. This would include the development of an accident location layer in GIS, maintenance of a high accident location list, development of collision and condition diagrams, and the analysis of the effectiveness of the improvement program through before and after studies.
- **A traffic improvement program is not in place to proactively design and implement traffic system management measures to reduce traffic congestion and travel time delay.** This would include transportation system management measures that would serve to maximize the traffic flow in the existing streets and improve the smoothness of this traffic flow, enhance the coordination of traffic signals, rephrasing of signals to enhance the capacity of intersections, the design of re-striping of streets to provide additional turn lanes, retiming of signals to more effectively utilize green times depending on peak hour traffic, removal of parking to provide left turn lanes, etc.
- **A computerized traffic model is not in place.** This model would be used for traffic forecasting to assess the impacts of proposed developments and the benefits of arterial street improvements proposed by Traffic Engineering.
- **Traffic counts and speed studies are not routinely conducted.** The Division is not routinely collecting traffic counts. These would focus on major streets. This data would be utilized for operational studies, census counts, and for checking the computerized traffic model. Speed surveys should be done on a four year cycle should be utilized to adjust the speed limits or enhance the enforcement efforts of the Police Department.

Overall, the Public Works Department should be authorized a total of five professional and technical engineering positions. These positions should include a Principal Traffic Engineer (with a professional engineers license or registration), two Assistant Civil Engineers, and two Traffic Technicians. The Principal Traffic Engineer

should function as a section-head and report to the City Engineer.

Recommendation: Five professional and technical engineering positions should be authorized for traffic engineering. These positions should include a Principal Traffic Engineer (with a professional engineers license or registration), two Assistant Civil Engineers, and two Traffic Technicians. The Principal Traffic Engineer should function as a section-head and report to the City Engineer.

Recommendation: The Engineering and Traffic Division should develop and install a comprehensive traffic engineering program that includes traffic improvement and traffic safety engineering.

Recommendation: The Junior Civil Engineer allocated to the traffic engineering section at present should be upgraded to an Assistant Civil Engineer.

(12.3) Twelve Engineers and Technicians Should Be Authorized for Engineering.

The Engineering and Traffic Division allocates fifteen staff to Engineering for capital project design and construction inspection, plan checking of development inspections and construction inspection of developer constructed infrastructure to assure conformance to standard specifications, etc. Those positions that are filled at present (as of April 12, 2005) include the following:

- A Senior Civil Engineer;
- Seven Assistant Civil Engineers;
- An Engineering Document Technician;
- Two Senior Engineering Aids;
- A Junior Engineering Aid;
- A Streets and Engineering Foreman allocated to inspection of road occupancy permits;
- A Streets and Engineering Foreman allocated to Digsafe (this position is budgeted in the Water and Sewer Division); and
- A Traffic Permit Supervisor.

There are, in addition, seven vacant positions including four Junior Civil

Engineers, a Senior Engineering Aid, an Assistant Deputy Director – Engineering and a Deputy Director.

The project team analyzed the staffing requirements for civil engineering. The analysis of the staffing requirements is presented below.

- **Five staff would be required for the design and construction management of capital projects.** The funding for the capital improvement program for 2005 is presented below. This is not a significant level of funding for a city with the population of Springfield. It does not include any capital projects for water and sewer such as main replacements.

| | |
|-----------------------------|--------------------|
| Arterials-Mayor | \$2,000,000 |
| Main Arterial Overlay | \$700,000 |
| Residential Overlay | \$1,400,000 |
| Sidewalk Replacement | \$300,000 |
| North Main Street Sidewalks | \$50,000 |
| Private Street Construction | \$200,000 |
| Crack sealing | \$200,000 |
| Traffic Signals | \$200,000 |
| Route 20A | \$1,500,000 |
| Sidewalks-Schools | \$2,000,000 |
| TOTAL | \$8,550,000 |

The staffing levels for the design and construction management of these projects amounts to approximately five professional and technical engineers. This would be the staffing required for planning and scoping, design, design administration, construction surveying, construction inspection, and construction management.

- **An Assistant Civil Engineer position should be allocated to long-term infrastructure planning.** This position should be responsible for the pavement management program as well as the development of long-term infrastructure plans like that prepared by North Attleborough. This would include streets, sidewalks, storm drains, and bridges.
- **Four positions would be required for development review including Digsafe and Road Occupancy Permits.** These positions would be required for definitive subdivision review, site plan review, minor modifications, etc., construction inspection of the developer constructed infrastructure, issuance and inspection of road occupancy permits and response to Digsafe requests. The workload that these positions face is presented below.
 - **An Assistant Civil Engineer is allocated to plan checking of development review applications including definitive subdivision plans, site plan reviews, minor modifications, etc and the issuance of**

road occupancy permits. Plan checks for conformance to standard specifications including water and sewer. During the 30 months from June 2002 through December 2004, the Assistant Civil Engineer completed plan checks of 60 major site plan reviews (with an additional 10 pending review), 13 subdivision reviews, and 13 sanitary sewer extensions. This equates to an average of 3 major site plan reviews, subdivision reviews, and sanitary sewer extensions a month. This is insufficient workload for this position on a full-time basis. This position should also assume responsibility for issuance of road occupancy permits. An estimated 1,155 road occupancy permits were issued in 2004, or approximately 5 permits a day. If these permits require approximately 30 minutes each to process, the workload amounts to approximately 0.3 full-time equivalent.

- **A Senior Engineering Aide should be utilized for construction inspection of developer-constructed public improvements.** As noted in the previous paragraph, plan checks of 60 major site plan reviews, 13 subdivision reviews, and 13 sanitary sewer extensions were completed during the 30 months from June 2002 through December 2004. If these plan checks were under construction during this 30-month period, that would indicate that during any construction season of approximately 8 to 9-months each year, this Senior Engineering Aide would have twenty-one site plan applications under construction, four subdivisions, and four sanitary sewer inspection assuming a 9-month construction season. This is sufficient workload for this position on a full-time basis during the construction season. This position should be utilized in the non-construction season to assist in the design of capital improvement projects.
- **A Senior Engineering Aide should be allocated to the Digsafe program.** There were a total of 1,192 Digsafe mark-outs in 2004 or an average of 7 per day assuming a 9-month construction season. This is the equivalent of a one-half to three quarters workload. This position should be utilized in the non-construction season to assist in the design of capital improvement projects.
- **A Senior Engineering Aide should be allocated to the inspection of road occupancy permits and to assist in construction inspection of developer-constructed public improvements.** An estimated 1,155 road occupancy permits were issued in 2004, or approximately 5 permits a day. This is equivalent to 0.3 to 0.4 full-time equivalent workload. This position should also be utilized to assist in the inspection of developer-constructed public improvements, and, during the non-construction season, to assist in the design of capital improvement projects.

A total of ten line staff – consisting of Assistant Civil Engineers and Senior

Engineering Aides would be required. The project team also recommends that two Senior Civil Engineer positions be allocated. One of these two Senior Civil Engineer positions should supervise the five Assistant Civil Engineers and Senior Engineering Aides allocated to the design and construction management of capital projects and the Assistant Civil Engineer assigned to long-term infrastructure planning. The other Senior Civil Engineer would supervise the Assistant Civil Engineer and three Senior Engineering Aide positions allocated to development review.

Recommendation: Twelve professional and technical engineering staff should be authorized for engineering.

(12.4) Four Specialized Positions Within the Traffic and Engineering Division Should Be Reclassified.

There are four specialized positions within the Engineering and Traffic Division. These four positions include the Traffic Permit Supervisor, Engineering Document Technician, and the two Streets and Engineering Foremen. Given the current scope and depth of the workload within the Engineering Division, the Division can ill-afford specialized positions.

These four positions should be reclassified within the Engineering Aid series and flexibly utilized depending on the construction workload and season and the workload within the various programs within the Traffic and Engineering Division. The four positions that should be reclassified and the basis for their reclassification are presented below.

- **Traffic Permit Supervisor.** This position is responsible for the issuance of road occupancy permits. This position is budgeted in Parking Meters. This position should be reclassified within the engineering aide series and utilized within the development review program. This position issued approximately 1,155 permits in 2004, primarily for general roadway excavation. If these permits require approximately 30 minutes each to process, the workload amounts to

approximately 0.3 full-time equivalent. There clearly is insufficient ongoing workload for this position. This workload should be reassigned to the Assistant Civil Engineer. The Traffic Permit Supervisor should be reclassified within the engineering aid series and utilized within traffic engineering.

- **Engineering Document Technician.** This position is responsible for the scanning of documents, recording as built plans, and the like. This position is grossly underutilized, and clearly has insufficient workload within the context of the duties and responsibilities of the classification. The position should be reclassified within the Engineering Aid series and utilized within traffic engineering.
- **The two Streets and Engineering Foremen positions should be reclassified as Senior Engineering Aides.** These positions are dedicated to construction and permit inspection during the construction season. However, during the non-construction season, these positions should be utilized to assist in the design of capital improvement projects. Given the classification titles of these two positions, these positions are limited in their ability to fulfill that role. These two positions should be reclassified as Senior Engineering Aides so that the positions can be utilized more flexibly.

Recommendation: The Traffic Permit Supervisor position, two Street and Engineering Foreman positions, and the Engineering Document Technician position should be reclassified within the engineering aid series and utilized as generalists within the capital improvement program and the development review program.

(12.5) Four of the Seven Vacant Positions Within Engineering Should Be Eliminated.

This analysis of staffing levels within Engineering indicates that the four of the seven vacant positions should be eliminated. Two of the remaining positions should be reclassified and filled as section heads: one as a Senior Civil Engineer, and the other as Principal Traffic Engineer. The other position – the Deputy Director – Engineering – should be reclassified as a City Engineer and function as the division head for the Engineering and Traffic Division.

The four vacant positions that should be eliminated include the following:

- A Senior Engineering Aide position; and

- Three of the four Junior Civil Engineer positions.

Recommendation: Four of the seven vacant positions within the Engineering should be eliminated.

Recommendation: The Deputy Director – Engineering position should be reclassified as the City Engineer, and recruitment for the position should begin immediately.

Recommendation: A Junior Civil Engineer position should be reclassified as Principal Traffic Engineer, and recruitment for the position should begin immediately.

Recommendation: The Assistant Deputy – Operations for Engineering position should be reclassified as Senior Civil Engineer, and recruitment for the position should begin immediately.

(12.6) Staffing For The Preventive Maintenance of and Repair of Traffic Signals Is Sufficient, But The Two Laborer Positions Should Be Upgraded to Traffic Signal Technicians.

The City of Springfield has an estimated 200 signalized intersections. The project team uses a benchmark of one technician per 35 to 40 signalized intersections. This would indicate that the level of overall staffing is sufficient since the Engineering and Traffic Division is authorized a Maintenance Electrician, Electronic Technician, Traffic Signal Technician, and two Laborer's for traffic signal maintenance. However, the two Laborer's should be upgraded to Traffic Signal Technician's.

This section uses two-person crews; the Laborer is the second staff person in these crews. This crew size should be a one-person crew for cabinet maintenance, electronic equipment inter-tie repair, signal trouble calls and traffic signal inspection. Two person crews would be required for loop replacement.

Recommendation: The two Laborer positions assigned to traffic signal maintenance and repair should be upgraded to Traffic Signal Technicians.

Recommendation: The crew size utilized for traffic signal maintenance and repair should be adjusted to one-person for cabinet maintenance, electronic equipment

inter-tie repair, signal trouble calls and traffic signal inspection.

Recommendation: The section should utilize one-person crews for cabinet maintenance, electronic equipment inter-tie repair, signal trouble calls and traffic signal inspection.

(12.7) The Level of Staffing is Sufficient for the Insourcing of Painting Pavement Legends.

The table below presents the work orders for signs for 2004. As the table indicates, the sign crew completed 1,687 work orders in 2004. The project team uses a benchmark of 10 signs installed or replaced per day. Given this metric, a total of 168.7 crew days would have been required. This is equivalent to one crew completing these work order 73% of the year.

| | |
|-------------------------|--------------|
| Sign Poles | 621 |
| Do Not Enter Signs | 22 |
| Parking Regulation Sign | 420 |
| One Way Signs | 17 |
| Island Signs | 52 |
| Sign Bases | 143 |
| Speed Limit Sign | 19 |
| Stop Signs | 110 |
| Street Name Signs | 283 |
| | 1,687 |

However, a two-person crew size is utilized. The project team utilizes a one-person crew as its benchmark. The crew size for sign installation or replacement should be adjusted to one-person.

The second person in this crew, and a “floater” Skilled Laborer in this unit, should be reallocated as a pavement legend painting crew. This service is presently contracted out. This service should be insourced with this two-person crew. The present cost of the contract amounts to \$65,000 annually. The project team estimates that there are approximately 2,000 pavement legends in the City of Springfield. Painting these pavement legends once annually would require approximately one-half of this crew’s

efforts on a year-round basis. Since these legends can only be painted weather permitting, this level of workload indicates that this crew should be able to meet this level of service. The City may need to purchase a truck equipped with an air compressor to assume responsibility for legend painting.

Recommendation: The level of staffing for sign maintenance should be reduced by two positions.

Recommendation: A one-person crew should be utilized for sign maintenance and repair.

Recommendation: The responsibility for pavement legend painting should be insourced with the use of a two-person crew.

(12.8) The Six Vacant Positions Within Traffic Should Be Eliminated.

There are six vacant positions within Traffic. These include two Skilled Laborer positions, one Working Foreman Skilled Laborer position, two Maintenance Craftsman positions, and one Working maintenance Foreman position.

The workload and staffing analysis by the project team indicates that there is insufficient workload to fill these positions. In fact, with the existing filled positions within Traffic, an opportunity exists to insource pavement legend painting.

Recommendation: The six vacant positions within Traffic should be eliminated. This includes two Skilled Laborer positions, one Working Foreman Skilled Laborer position, two Maintenance Craftsman positions, and one Working maintenance Foreman position.

(12.9) One of the Two Positions Assigned to The Conservation Commission Should Be Eliminated, and The Remaining Position Should Assume the Lead for Implementation of NPDES for the City.

The project team interviewed staff assigned to the support of the Conservation Commission: the Environmental Management Planner and the Environmental Affairs Administrator. The responsibilities of these two staff are presented below.

- **Environmental Affairs Administrator.** This position manages the program, conducts plan checks and issues permits such as requests for determination and notices of intent, conducts inspections to assure compliance with the permits, and attends the Conservation Commission meetings.
- **Environmental Management Planner.** This position conducts plan checks and issues permits, prepares the agenda for the Conservation Commission, conducts inspections to assure compliance with the permits, and attends the Conservation Commission meetings.

The workload faced by this approximates 15 to 20 requests for determination a year, 20 to 25 notices of intent, 5 abbreviated notices of resource area delineation, and 20 to 25 certificates of compliance. The two staff conduct between 350 to 400 inspections annually.

This workload does not support the allocation of two positions. One of these positions should be sufficient given the volume of permits and the number of inspections. The reduction of one of these positions would require clerical support from the Principal Clerk Typist in the Engineering and Traffic Division, however, for the preparation of agendas for the Conservation Commission.

The role of the remaining position should be expanded to include the work necessary to support the City's efforts in compliance with NPDES. The Public Works Department has not been timely in achieving compliance, and this should be addressed by the position that also supports the Conservation Commission.

Recommendation: The Environmental Management Planner position should be eliminated.

Recommendation: The Environmental Affairs Administrator position should assume responsibility for NPDES implementation for the City.

13. THE PUBLIC WORKS DEPARTMENT SHOULD ESTABLISH A PREVENTIVE MAINTENANCE PROGRAM FOR SIGNALIZED INTERSECTIONS.

The City of Springfield has an estimated 200 signalized intersections. The project

team uses a benchmark of one technician per 35 to 40 signalized intersections. This would indicate that the level of overall staffing is sufficient since the Engineering and Traffic Division is authorized a Maintenance Electrician, Electronic Technician, Traffic Signal Technician, and two Laborer's for traffic signal maintenance. However, as noted previously, the two Laborer's should be upgraded to Traffic Signal Technician's, and one-person crews utilized rather than the current practice of two-person crews.

While there are sufficient staff, the Engineering and Traffic Division is not preventively maintaining traffic signals. This preventive maintenance should include:

- Cabinet maintenance includes the inspection, testing, cleaning and adjustments made to the traffic signal electronic equipment cabinet. This should be performed with a one-person crew twice annually. It includes such activities as testing the conflict monitor, vacuuming the cabinet, checking the timing, etc.
- Traffic signal inspection. This should be performed with a one-person crew. This should be performed on a two-year cycle and involve regularly scheduled inspection of traffic signal intersections to check for proper operation of luminaires, vehicle and pedestrian detection systems, and vehicle and pedestrian signal faces. Signal faces are inspected for proper alignment and adjusted if necessary.

The levels of staffing are sufficient to provide meet this preventive maintenance level.

Recommendation: The Public Works Department should establish a preventive maintenance program for traffic signals.

14. THE PUBLIC WORKS DEPARTMENT SHOULD RENEGOTIATE THE CONTRACT WITH THE WATER AND SEWER COMMISSION REGARDING THE PROVISION OF ENGINEERING SERVICES.

The City of Springfield and the Water and Sewer Commission have entered into an agreement in which the Public Works Department maintains the wastewater collection system and the water distribution system owned by the Commission. This is a 10-year agreement that expires on June 30, 2010. The contract includes the provision of support services by the Public Works Department including engineering services.

These services are to be provided to the Commission as requested. The work includes, but is not necessarily limited to, acceptance of sewer extension permits and associated site plan review, sewer line inspections, pipe inspections by television equipment, maintenance of the sewer book system and sewer, water, and storm drain plans, and other services.

The contract is unclear regarding whether the design and construction inspection of the replacement of water and sewer mains is included within these services and that the Public Works Department shall provide the services.

Recommendation: The City should renegotiate the contract with the Water and Sewer Commission to clarify that the Public Works Department shall provide design and construction inspection of the replacement of water and sewer mains.

15. THE PUBLIC WORKS DEPARTMENT SHOULD NOT WAIVE LIFE-CYCLE PAVEMENT FEES, BUT SHOULD COLLECT THESE FEES FROM ALL UTILITIES AND ADJUST THE FEES TO REFLECT CURRENT COSTS.

It is clear that utility cuts shorten the life of an asphalt street. The research demonstrating this is significant. For example:

- Studies have demonstrated the link between the presence of utility cuts and accelerated pavement deterioration. The accelerated pavement deterioration is linked to reduced pavement life.
- A recent local government study concedes that high quality workmanship in the repair of utility trenches may reduce the structural damage to pavements, but contends that lower ride quality, increased cracking still result and therefore service lives are diminished.
- Deflection testing in areas adjacent to the trench show that trenching operations reduce pavement strengths in a zone from 3 to 6 feet either side of the centerline of the trench.
- The economic impact of utility cuts is often calculated based on the increased thickness of overlay required to compensate for the presence of the utility cut. Full recovery of the cost does not appear politically possible in most cases.
- Many agencies have adopted a graduated scale that reduces the utility cut fee

based on the age (time since last overlay) of the pavement. Some have imposed moratoriums on any utility cuts for one or more years following street rehabilitation.

- One large city has imposed a coordination clause asking the utilities to prepare five-year master repair plans. Utility cut fees may be waived for full coordination cooperation.

At present, the Public Works Department is waiving all utility cut or life-cycle pavement fees. These fees should not be waived. Each utility, including the Water and Sewer Commission, should be required to pay the full amount.

In addition, the fees should be increased. At present, the department collects \$50/square foot if the pavement is less than 5 years old, \$20/square foot if the pavement is 5 to 10 years old, and \$5 a square foot if the pavement is older than 10 years. Worcester charges utility cut fees substantially higher than this. The Public Works has not adjusted these fees in several years; it should evaluate its life cycle pavement fees and increase these fees as appropriate.

Recommendation: The Public Works Department should not waive its life-cycle pavement fees. Each utility, including the Water and Sewer Commission, should be required to pay the full amount.

Recommendation: The life-cycle pavement fees should be increased to reflect current costs.

16. THE PLAN OF ORGANIZATION FOR THE ENGINEERING AND TRAFFIC DIVISION SHOULD BE REVISED.

The current plan of organization for the Engineering Division is describes in the sections below.

- The Assistant Deputy Director-Traffic supervises a Traffic Engineering Foreman, who in turn, supervises the maintenance and repair staff assigned to parking meters, signs, traffic signals, etc.
- A Senior Civil Engineer supervises the thirteen professional and technical engineering staff and the Principal Clerk Typist.

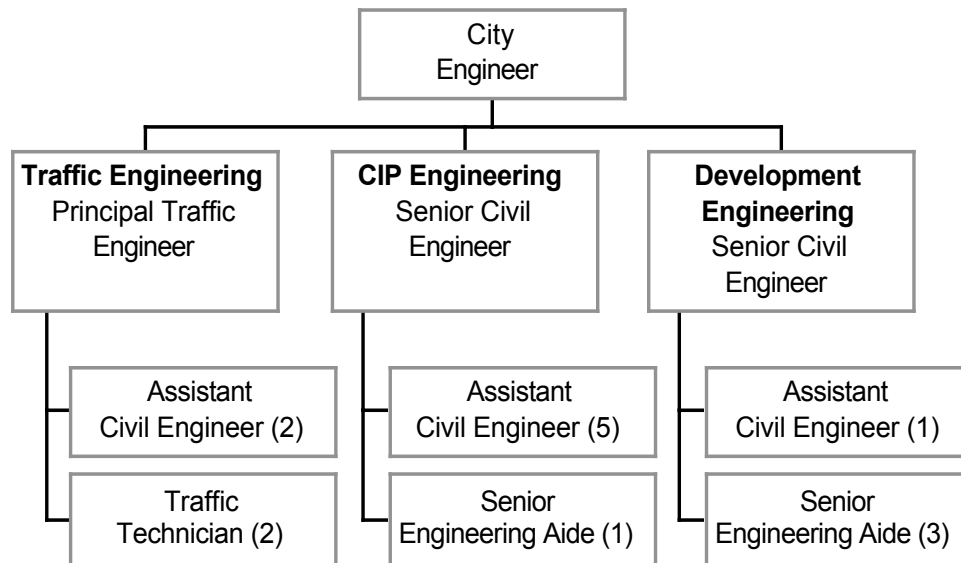
This plan of organization has a number of limitations including too narrow of a span of control in Traffic and a too wide span of control in Engineering.

The plan of organization for the Engineering and Traffic Division should be modified as described below.

- The Deputy Director-Engineering position should be reclassified as City Engineer and filled. This position would report directly to the Public Works Director.
- A Senior Civil Engineer would supervise the professional and technical staff assigned to development review and construction inspection of development related construction.
- A Senior Civil Engineer would supervise the professional and technical staff assigned to capital project design and construction inspection including long-term infrastructure planning.
- A Principal Traffic Engineer would supervise the professional and technical staff assigned to traffic engineering.
- The Assistant Deputy Director for Traffic position should be eliminated.
- The responsibility for managing the staff assigned to maintenance and repair staff assigned to parking meters, signs, traffic signals, etc. should be assigned to Streets (also known as the Highway Division). These staff should be reallocated in the budget and in the plan of organization to that Division.

The proposed plan of organization is presented on the following page.

Recommendation: The plan of organization of the Engineering and Traffic Division should be modified.



7. GARAGE DIVISION

7. GARAGE DIVISION

This chapter of the report analyzes the operations of the Garage Division. The Garage Division is responsible for the repair and maintenance of the City's fleet of vehicles and equipment, with the exception of those assigned to the Police and Fire Departments. Services include vehicle and equipment repair, preventive maintenance, welding, tire repair and replacement, vehicle replacement and specification development, as well as other related services. The Division operates two shifts, the day shift being from 6:00 a.m. till 2:00 p.m., the evening shift being from 2:00 p.m. till 10:00 p.m. The Division is authorized twenty-two positions (excluding the positions assigned to Stores), with three of those positions being vacant at the present time (excluding the vacant positions assigned to Stores) including a Principal Clerk Typist and two Master Mechanics.

1. OPPORTUNITIES EXIST TO REDUCE THE NUMBER OF VEHICLES IN THE FLEET.

The Public Works Department utilizes the Petro Vend automated fuel dispensing system. Until recently, this system required that users wishing to dispense fuel enter the vehicle number onto a keypad at the pump prior to fueling. The system would then dispense the desired amount of fuel and record the equipment number, odometer reading and the gallons of fuel dispensed. The system would then perform internal calculations such as the miles per gallon and fueling cost per mile.

The Department is converting to a key system that requires employee must still input odometer readings manually.

The project team obtained a summary of fuel usage records for all units receiving fuel at the pump located at the Public Works yard for the period of January 1, 2004

through March 1, 2005 (a 14 month period). These records were then transcribed by the project team into an electronic spreadsheet that had been populated with all Public Works vehicles and equipment that received any maintenance and repairs during the period of July 1, 2003 through June 30, 2004 (fiscal year 2004). The results of the comparison indicated that there are many units in the fleet which received no fuel during the 14-month period, and many which received a very low amount of fuel. The following table provides a summary of the results.

| Element | Number |
|--|---------------|
| No. of DPW Motorized Units Receiving Maintenance and Repairs | 236 |
| No. of DPW Motorized Units Receiving Fuel | 154 |
| Pct. Of DPW Motorized Units Receiving Fuel | 65.3% |
| No. of Units Receiving 100 Gallons or Less | 125 |

Highlights resulting from a review of the table above include the following:

- Although there were 244 total units receiving some degree of maintenance and repair during fiscal year 2004, eight (8) of these were non-motorized trailers, and were omitted from the table above.
- Slightly fewer than two-thirds of the motorized fleet received any fuel during the 14 month period in the fueling summary, although each received some degree of maintenance and repair. (There were 82 units that received no fuel at all during the 14-month period.)
- Of the 236 total motorized units in the fleet that received maintenance and repair, 125 of these received 100 gallons or less. Of these, 19 received 50 gallons or less.

The fuel usage report made available to the project team contains numerous input errors for odometer readings of a magnitude that indicates that most employees do not input correct odometer readings into the Petro Vend system at the time of fueling. There does not appear to any quality control of the data. However, the analysis of vehicle and equipment utilization is an extremely important tool by which to gauge several fleet characteristics, such as potential for vehicle “pooling”, potential reduction of

the fleet due to poor (or non-) utilization, as well as instances in which specific units receive an extraordinary amount of fuel (indicating either poor fuel economy or employee malfeasance).

The City should take a number of steps to reduce the number of vehicles within its fleet. These steps include the following.

(1) Vehicle Utilization Standards Should Be Developed.

The City should develop and implement vehicle utilization standards as screening devices along with a regular vehicle justification process. In establishing new fleet assignment and utilization monitoring policies and procedures, the fleet management organization should be careful to define the proper use of monthly or annual vehicle usage standards. There is a tendency to define vehicles as needed or unneeded based on such standards. This tendency should be avoided.

Mileage, and daily or hourly usage amounts can be used to identify potentially underutilized units. However, usage statistics alone can also be very poor indicators of the true need for a vehicle or piece of equipment. The project team typically defines a vehicle as being in use when it is not readily available for use by another organization or employee. In such situations, a vehicle may or may not be accumulating miles or engine hours. For example, a plumber's van loaded with supplies and equipment might fit this description. Its odometer will indicate that it is not driven very much, but this clearly does not mean that the vehicle is under utilized or not needed.

For these reasons, vehicle assignment justification and utilization monitoring procedures should define the need for and use of vehicles and equipment from as many perspectives as possible. Mileage readings are only one of these. In addition, other

utilization standards should be used to screen vehicle assignments or vehicle purchase requests for detailed scrutiny and should be tailored to the different types of vehicles and the different environments in which departments and divisions operate.

Recommendation: Vehicle utilization standards should be developed.

(2) Economic Incentives Should Be Provided for Reduction of Vehicles Assigned to Departments.

In addition, economic incentives should be used to maximize the utilization of fleet assets. Through the development and implementation of service based operating charge-back rates and accurate rates that depict the cost of owning the vehicles and equipment, users will become more aware of the actual costs associated with owning and operating a unit.

Recommendation: Economic incentives should be provided for reduction of vehicles in the City's fleet.

2. THE CITY'S FLEET IS OLD AND IS NOT BEING REPLACED IN ACCORDANCE WITH APPROPRIATE REPLACEMENT GUIDELINES.

In well-managed fleet operations, the Fleet Manager plays a critical role in the timely and programmed replacement of the fleet of vehicles and equipment. This is the case in the City of Springfield's Garage Division. However the City's ability to replace the fleet has been limited in recent years, with a predictable effect upon fleet age and operability.

The Garage, in 2002, reported the following replacement guidelines:

| Equipment | Replacement Guideline |
|---|------------------------------|
| Passenger cars, pickups, utility trucks, vans | 10 years |
| Jets and Jet Vacs | 5 to 10 years |
| Dump Trucks | 10 to 12 years |
| Heavy Equipment; loaders, backhoes, etc. | 5 to 15 years |

As can be seen in the table, the list of guidelines is not extensive, nor is it specific regarding most equipment types. Further, the range of 5 to 15 years for “Heavy Equipment” is not useful in guiding policy, as this is far too broad to provide any meaningful information. The amounts allocated to fleet replacement from fiscal year 1998 through 2002 are presented in the table below.

| Fiscal Year | Replacement Allocation |
|--------------------|-------------------------------|
| 1998 | \$475,000 |
| 1999 | \$498,000 |
| 2000 | \$514,000 |
| 2001 | \$540,000 |
| 2002 | \$567,111 |
| Total | \$2,594,111 |

As can be seen in the table, the total allocation for fleet replacement from 1998 through 2002 was \$2,594,111, averaging \$518,822 per year over the five-year period. There are reportedly 265 vehicles and pieces of equipment assigned to the Public Works Department. If it can be assumed that the average unit is valued at \$50,000 (the project team does not possess actual data regarding original purchase costs), then the total value of the fleet is approximately \$13,250,000. The allocation of \$518,822 per year to replacing the fleet effectively results in an overall replacement cycle of 25.5 years.

The project team analyzed the extent to which the City adhered to these minimal guidelines, and found that the age of the existing fleet exceeds these guidelines on the whole. Although not all units indicated model years, those for which this data existed were divided into two broad categories of “light” and “heavy” equipment, and the average ages were calculated. This approach indicated that the average “light” equipment age is currently 9.5 years, and the average “heavy” equipment age is 8.9 years. To place this within some context, if the fleet replacement guidelines in the table

above were strictly observed, the average age of passenger cars, pickups, utility trucks, etc. (i.e., the light fleet) would be one-half of the replacement guideline, or 5 years. The current age of these units (at least for the 73 units for which the project team possessed adequate data) is 9.5 years, or 90% greater than the replacement guideline

The heavy equipment fleet is in a similar position regarding overall age, at 8.9 years per unit for the 79 units for which sufficient data was available to make the calculation. However, this average age would be substantially higher if the relatively lower ages of the solid waste fleet were removed from the calculation. Although the project team did not have accurate data for street sweepers, these units were reportedly purchased originally in 1993 to 1994, making these units about 11 years old. The 13 dump trucks for which data were available indicates that this segment of the fleet averaged 11.5 years per unit. These ages are far in excess of reasonable replacement guidelines, and given the relatively intensive maintenance effort required of these particular fleet types even under ideal circumstances, they have a great impact upon the time expended by mechanics in their repair.

There is a clear consequence of an older fleet: higher operating and maintenance expenditures. These consequences are presented in greater detail in the paragraphs below.

- This study completed by Chatham Consulting in 2002 of the Garage Division evaluated the number of mechanics needed using the maintenance and repair unit approach. One maintenance and repair unit equates to about 17 to 20 mechanic hours per year or the equivalent of the annual maintenance and repair work required for a passenger sedan. For this study, the consulting team in 2002 used the higher end of the ratio due to the age of the fleet. If the lower end of the ratio were utilized, the Garage Division would need two fewer mechanics.
- There are a number of metrics that we have utilized to evaluate the competitiveness of a fleet. One such metric that we have used for evaluating the

cost competitiveness of a fleet services organization is cost per vehicle equivalent unit (VEU). Our methodology for analyzing and comparing a fleet organization's maintenance and repair costs to an industry standard involves calculating the total number of vehicle equivalent units for the fleet and dividing this into annual maintenance and repair costs. Our benchmark is \$900 to \$1,200 per VEU. The actual costs within the Garage Division amount to \$1857 per VEU. Parts alone amount to \$1,042 per VEU. This problem is a particular issue in the Public Works Department. There are some clear examples in 2003-04 of vehicles whose maintenance and repair costs are excessive given their replacement costs. For example:

- \$3,123 was spent in labor and materials in the maintenance of a pickup truck - #377211– assigned to Public Works;
- \$2,957 was spent in labor and materials in the maintenance of a pickup truck - #377213– assigned to Public Works;
- \$2,866 was spent in labor and materials in the maintenance of a pickup truck - #377225– assigned to Public Works;
- \$3,689 was spent in labor and materials in the maintenance of a pickup truck - #377234– assigned to Public Works; and
- \$3,847 was spent in labor and materials in the maintenance of a pickup truck - #377254– assigned to Public Works.

These issues appear to be largely driven by the solid waste collection fleet, which has high demands placed on it and is expensive to operate and maintain.

The Assistant Deputy Director-Garage develop a five year replacement plan for consideration of the Public Works Director and the Finance Director that identifies the units proposed for replacement over the next five fiscal years by unit number.

In the development of this five year replacement plan, the Assistant Deputy Director-Garage should then identify units which (1) may be safely eliminated from the fleet without serious operating consequences based upon their levels of utilization, and (2) those units that pose a safety concern, and/or which are exhibiting unusually high costs of operation.

In addition, the Assistant Deputy Director-Garage should develop a formal replacement policy for the City's fleet.

Recommendation: The Assistant Deputy Director-Garage develop a five year replacement plan for consideration of the Public Works Director and the Finance Director that identifies the units proposed for replacement over the next five fiscal years by unit number and the estimated cost per unit and by fiscal year.

Recommendation: The Assistant Deputy Director-Garage should develop a formal replacement policy for the City's fleet for the consideration of the Public Works Director and the Finance Director.

3. THE CITY SHOULD ESTABLISH A FLEET REPLACEMENT FUND.

The current method of funding vehicle replacements can be extremely costly to the City, both currently and in the longer-term, in terms of operating and maintenance costs, the staffing required to provide the service, and problems with consistent delivery of services due to equipment breakdowns.

The City should establish a vehicle fleet replacement fund. There are basically two elements to the establishment of replacement charges associated with this fund:

- Determining the optimum replacement cycle for a given unit or category of units; and
- Identifying the replacement cost for the vehicle.

The first of these two elements, the determination of the optimum replacement cycle for a category of units, can be a complex and highly accurate calculation if the City had available an adequate cost history for vehicle maintenance and repairs. This is not the case in the City of Springfield currently, however. Many municipalities do not have accurate cost histories, and therefore utilize standardized replacement cycles for various categories of equipment. The Assistant Deputy Director – Garage will need to

utilize other resources, such as those from the National Association of Fleet Administrators, to develop these replacement guidelines.

The second element is establishing the replacement cost of the vehicle. The Assistant Director – garage can utilize data from other fleets and the bid prices of the Massachusetts.

The establishment of a replacement fund not only ensures that sufficient funding is available for each unit's replacement, but it also eliminates the wide variations in vehicle replacement funding from year to year. Further, this method of funding forces user departments to continuously evaluate their respective needs for vehicles, as the monthly contribution to the fund comes directly from their capital budgets.

Recommendation: The City should establish a fleet replacement fund.

4. THE GARAGE DIVISION SHOULD BE ESTABLISHED AS AN INTERNAL SERVICE FUND.

The Garage Division does not currently charge departments for the fleet maintenance and repair services that it provides to these departments with the exception of parts. The most significant cost, labor, is budgeted in the Garage Division and not allocated as a cost to user departments.

This method has a number of drawbacks.

- It does not reflect the cost of providing services for user departments. If the City wishes to begin utilizing activity based costing, it is important that all costs, including fleet maintenance and repair, be allocated to these activities.
- For some departments such as Community Development-Housing, that are funded by revenues other than the general fund, it results in the general fund subsidizing these services.
- The current method does not hold these departments accountable for the services they utilize, as the costs are reflected only in the Public Works Departmental budget.

Well-managed fleets have established internal service funds, billing user departments for the services they consume. The labor rate charged is a product of the direct hourly compensation rates (plus benefits) of mechanics and helpers, including indirect costs of division management and administration.

In addition, the Division should charge out parts at cost plus an indirect rate to capture the cost of ordering, stocking, monitoring and dissemination of the parts. These parts should be directly charged to the vehicle receiving the part. The charges should include the full cost of the storeroom clerks as well as a pro rata share of the managerial and administrative salaries and benefits of the division. Typically, this rate will be in the range of 10% to 15% of the total direct cost of parts.

The establishment of the Garage as an internal service fund, with the objective of “breaking even” at the end of the year applies a standard of business discipline on both the Garage (in the management of costs and the maintenance of high productivity rates for all mechanics) as well as operating departments (in the more judicious consumption of Garage services and the proper preventive maintenance of units to minimize emergency repair costs over time).

The Garage has recently obtained and installed a new management information system that will assist the Assistant Director - Garage in accumulating, reporting and analyzing the costs of the services it provides.

Recommendation: The Garage Division should be established as an internal service fund.

5. ONE OF THE TWO VACANT MASTER MECHANIC POSITIONS SHOULD BE ELIMINATED AND THE OTHER FILLED.

The project team received copies of the fiscal year 2005 (through February 7) mechanic time charges for each of the personnel at the Garage. Although not all of these time charges were summarized by the project team, a sample of four mechanics was taken, and the results of the sample indicated that these four mechanics charged a very high proportion of their available time to the repair and maintenance of the fleet. The following table summarizes the results of the sample.

| Mechanic | Total Hours | Total Available Hours | Direct Charges to Vehicles and Equipment | “Chargeable” Rate |
|-----------------|--------------------|------------------------------|---|--------------------------|
| Mechanic 1 | 1,514 | 1,060 | 883.5 | 83.4% |
| Mechanic 2 | 1,534 | 1,236.5 | 1,157 | 93.6% |
| Mechanic 3 | 1,288 | 972 | 900 | 92.6% |
| Mechanic 4 | 1,474 | 1,195 | 1,124 | 94.1% |
| Total | 5,810 | 4,463.5 | 4,064.5 | 91.1% |

The following points highlight and explain the figures in the table:

- The “Total Hours” in the second column vary by employee due to various reasons, however the primary one is the variance in the number of overtime hours worked by each employee.
- The “Total Available Hours” column subtracts from the Total Hours the numbers of sick, vacation, holiday and training hours taken by the particular mechanic.
- The “Direct Charges to Vehicles and Equipment” column subtracts from the Total Available Hours any time charges to “non-billable” work. Examples of this type of charge include snow and ice removal (typically performed on overtime), parts pick up, building maintenance, etc.
- The “Chargeable Rate” column indicates the percentage of time that each mechanic reported working on specific units in the fleet.
- The lowest of the chargeable rates, 83.4%, represents a substantial percentage of time charged to work orders. The project team typically experiences chargeable rates in the range of 70% to 75%. Clearly, the other three mechanics reflected chargeable rates far in excess of the project team’s typical experience.

The Garage Division appears to have addressed one of the findings of the 2002 study of the Garage, completed by Chatham Consulting Inc., that indicated that slightly less than 50% of work performed by first shift mechanic staff was for direct, “wrench turning” activities. The percentage for the second shift was about 66%.

This study evaluated the number of mechanics needed using the maintenance and repair unit approach. One maintenance and repair unit equates to about 17 to 20 mechanic hours per year or the equivalent of the annual maintenance and repair work required for a passenger sedan. For this study, the consulting team in 2002 used the higher end of the ratio due to the age of the fleet. The consultant also assumed that City mechanics do about 95% of the maintenance and repair work in-house, and that their average billable hours approximates 65%. (The project team believes that a higher billable hour target should be used and that it should approximate 1,500 hours per mechanic per year). Given that the City has 1,011 maintenance and repair units, the Garage Division would need 13 mechanics as identified in the table below.

| | |
|---------------------------------------|--------|
| Maintenance and Repair Units (MRU) | 1,011 |
| Hours Per maintenance and Repair Unit | 20 |
| Total MRU Hours | 20,220 |
| % In-House | 95% |
| In-House Workload | 19,209 |
| Direct Hours Per Mechanic | 1,500 |
| Estimated Number of Mechanics | 13 |

The Garage Division presently has twelve filled Motor Equipment Repairman or Master Mechanic positions. There are also two vacant Master Mechanic positions. One of these two positions should be filled; the other vacant position should be eliminated.

Recommendation: The Garage Division should be authorized to fill one of the two vacant Master Mechanic positions.

Recommendation: One of the two vacant Master Mechanic position should be eliminated.

6. THE WELDER POSITION SHOULD BE ELIMINATED.

The Garage has historically had two Welder positions allocated to it. One of these Welder positions was eliminated. The productive rate of the remaining Welder position (defined as the ratio of direct-charged hours to hours available after omission of vacation, sick, holiday and training time) is less than 60%, for the period June 28, 2004 through February 7, 2005, as is shown in the table below.

| Element | Number |
|-------------------------------------|---------------|
| <i>Direct Charge Time</i> | |
| Repair Garage Equipment | 11 |
| Cooling System | 4 |
| Body (Tank) Interior and Exterior | 98 |
| Hoisting Devices | 94 |
| Lines/Hose/Fittings | 12 |
| Power Tail Gate | 10 |
| Track/Cleats | 3 |
| Blades/Buckets | 56 |
| Frame | 3 |
| Cylinders/Pistons | 20 |
| Rollers/Boggies | 7 |
| Brooms/Brushes | 2 |
| Plow/Rig/Pump (city and contractor) | 47 |
| Cutting Edge (city and contractor) | 31 |
| Doors | 23 |
| Mounted System | 16 |
| Landing Gear | 2 |
| Lighting System | 2 |
| Brakes Reline/Adjust | 4 |
| Air Intake System | 3 |
| Wheel/Rim/Hub/Bearing | 1 |
| Benchwork (fabricate and welding) | 45 |
| Spreader Repairs | 7 |
| Non Divisional/Dept. Repairs | 78 |
| Clean Equipment | 23 |
| Building Maintenance | 8 |
| Other | 8 |
| Total Direct Charge Time | 618 |

| Element | Number |
|---|---------------|
| Total Leave Time (Holidays, Sick, Vacation Personal, Training. Includes snow and ice removal conducted on O.T.) | 415.5 |
| Total Non-Productive Time | |
| Miscellaneous Garage Work | 413 |
| Miscellaneous (Not specified) | 14 |
| Vehicle Pickup and Shifting | 8 |
| Parts Pickup | 2 |
| Total Non-Productive Time | 437 |
| Total Available Time | 1,055 |
| Total Productive Rate | 58.6% |

As can be seen from the table above, the Welder position is achieving a chargeable rate of 58.6% of available hours. This is well below the chargeable rates achieved by mechanic staff, and is also below benchmark standards of productivity experienced by the project team as well. Typically these rates will average 70% to 72%. In fact, it is rare in the project team's experience for the welding function to be a viable service to perform in house, as most well-managed shop operations, including fleets with solid waste collection fleets, outsource this function or require their mechanics to provide this skill.

Recommendation: The Welder position should be eliminated.

7. THE RESPONSIBILITIES OF THE ASSISTANT DEPUTY OF OPERATIONS FOR THE GARAGE DIVISION SHOULD BE REDEFINED AS THE FLEET MANAGER FOR THE CITY'S FLEET WITH THE EXCEPTION OF THE FIRE AND THE POLICE DEPARTMENTS.

At present, the role and responsibilities of the Assistant Deputy of Operations is as a shop manager, responsible for managing the maintenance and repair of equipment brought to the shop at the Public Works Department for maintenance and repair. This role needs to be expanded as a Fleet Manager for the City's fleet with the exception of the fleet assigned to the Police and the Fire departments.

The essential roles and responsibilities of the position, besides managing the

maintenance and repair of the fleet, should include the following:

- Determining replacement of vehicles and direction in the purchase of new vehicles for all of the City's fleet with the exception of the fleet assigned to the Police and the Fire departments;
- Establish and administer vehicle replacement policies;
- Prepare specifications for new equipment purchases for all of the City's fleet with the exception of the fleet assigned to the Police and the Fire departments;
- Establish and administer the Vehicle Replacement Program through the Internal Service Fund and related fixed asset accounts;
- Develop rates for charging back users for maintenance, fuel and capital equipment costs;
- Maintaining duplicate keys for all of the equipment in the City's fleet, with the exception of the fleet assigned to the Police and the Fire departments; and
- Perform analyses to maintain and improve cost effective utilization of fleet equipment including recommending the elimination or pooling of underutilized equipment.

Recommendation: The classification title of the Assistant Deputy – Operations for the Garage Division should be changed to Fleet Manager.

Recommendation: The roles and responsibilities of the Assistant Deputy – Operations for the Garage Division should be broadened to include development of fleet replacement policies, development of rates for the proposed internal service fund, analysis of opportunities to eliminate or pool underutilized vehicles, and the development of specifications for replacement vehicles for the City's fleet with the exception of the fleet assigned to the Police and the Fire departments.

8. THE GARAGE DIVISION SHOULD UTILIZE THE STATE CONTRACT FOR PURCHASE OF LIGHT AND MEDIUM EQUIPMENT UNLESS IT CAN DEMONSTRATE THAT IT CAN BETTER THE PRICE.

The Garage Division does not routinely purchase light and medium equipment from the State contract. This is an unusual practice. Many other local governments in Massachusetts routinely utilize the State contract for the purchase of light and medium equipment such as sedans and pickup trucks.

Recommendation: The Garage Division should purchase light and medium equipment through the State contract unless it can demonstrate that it can better the price.

9. THE GARAGE DIVISION NEEDS TO TAKE STEPS TO FULLY IMPLEMENT THE VHB EQUIPMENT MANAGER SOFTWARE SYSTEM.

The Garage Division has recently purchased and installed the VHB Equipment Manager 2000 software system. The Division began to enter labor and parts into the system approximately two months ago. The capacity of the system is only partially utilized however. There are a number of capacities within the system that the Division needs to utilize including the following:

- Warranty management with the exception of the fleet assigned to the Police and the Fire departments;
- License and registration tracking with the exception of the fleet assigned to the Police and the Fire departments;
- Equipment parts inventory control; and
- Preventive maintenance scheduling for all vehicles in the City's fleet with the exception of the fleet assigned to the Police and the Fire departments.

The Garage Division has yet to input the equipment parts inventory into the VHB Equipment Manager 2000 software system and to provide access to the Store employees to this system that dispense parts to the staff of the Garage Division.

Recommendation: The Assistant Deputy of Operations should fully implement the capacity of the VHB Equipment Manager 2000 software system.

Recommendation: The equipment parts inventory should be input into the VHB Equipment Manager 2000 software system.

Recommendation: The Stores employees that dispense parts to the employees of the Garage Division should be provided access to the VHB Equipment Manager 2000 software system.

10. A VACANT PRINCIPAL CLERK TYPIST POSITION SHOULD BE FILLED AND ASSIGNED TO THE GARAGE DIVISION.

This position should be utilized to provide clerical support to the Garage Division and report directly to the Assistant Deputy – Operations for the Garage Division.

At present, clerical support is being provided through a multiple number of sources or essential clerical tasks are not being performed.

- The Assistant Deputy – Operations is typing the equipment specifications.
- The clerical staff for the Solid Waste Division is inputting labor and parts data from work orders.
- The Assistant Deputy – Operations registers vehicles.
- Once the VHB Equipment Manager 2000 software system, the Garage Division should distribute reports on a monthly basis to departments regarding the operating and maintenance costs for vehicles.
- The Garage Division is not proactively scheduling preventive maintenance of vehicles in the fleet using the VHB Equipment Manager 2000 software system, sending reminders to departments and divisions regarding the scheduled date of preventive maintenance, and overdue reminders.
- The staff of the Division are not receiving training on an ongoing basis. The most recent training apparently occurred over a year ago.
- The Business office is billing departments for the fuel that they are dispensing from Public Works Department storage tanks.

There is sufficient workload to warrant the filling of the vacant Principal Clerk Typist position.

Recommendation: The vacant Principal Clerk Typist position should be filled.

Recommendation: The Principal Clerk Typist should report directly to the Assistant Deputy – Operations.

Recommendation: The Principal Clerk Typist should be utilized, at a minimum, for entering labor and parts data from work orders into VHB Equipment Manager 2000 software system, distributing monthly operating and maintenance cost reports to departments and divisions, proactively scheduling preventive

maintenance of vehicles in the fleet using the VHB Equipment Manager 2000 software system, billing departments for the fuel that they are dispensing to their vehicles from Public Works Department storage tanks, and maintaining training records for the staff of the Division.

11. THE PUBLIC WORKS DEPARTMENT NEEDS TO TAKE STEPS TO IMPROVE THE ACCURACY OF THE ODOMETER READINGS ENTERED INTO THE PETRO VEND SYSTEM.

The fuel usage report made available to the project team contained numerous odometer input errors of a significant magnitude that indicates that most users do not input correct odometer readings into the Petro Vend system at the time of fueling. This indicates little emphasis is placed on the usefulness of the odometer data. However, odometer data is an extremely important tool to assess the potential for vehicle “pooling”, potential reduction of the fleet due to under utilization, as well as instances in which specific units receive an extraordinary amount of fuel (indicating either poor fuel economy or employee malfeasance).

The project team reviewed only the fuel and maintenance records of the units in the Public Works fleet. However, a cursory review of fueling records of other City departments indicates similar problems. While the Garage Division has provided reports regarding odometer readings to divisions and departments for reconciliation, it has not received responses and corrections.

This problem stems, in part, for the removal of software controls within the Petro Vend system that hinder the entry of inaccurate odometer readings.

Recommendation: The software controls within Petro vend should be restored.

Recommendation: The Principal Clerk Typist position should be utilized to follow up with divisions and departments regarding inaccurate odometer readings and the reconciliation of inaccurate odometer data entered into the Petro Vend system.

8. SOLID WASTE DIVISION

8. SOLID WASTE DIVISION

The Solid Waste Division provides single-family residential refuse collection services citywide, and refuse collection services for selected multi-family residential and selected commercial. The division also provides curbside recycling collection, bulk waste collection, and yard waste collection for single-family residential. The resource recovery facility at Bondi Island is operated by agreement with eco/Springfield LLC. The Division serves approximately 43,583 residential customers, 405 businesses, and 129 apartment buildings using both automated and semi-automated collection equipment. In addition, the Division contracts with Browning Ferris Industries to collect solid waste from 1,168 condominium units. The Solid Waste Division is funded by the general fund; the only revenue generated by the division is for bulk sticker tags, which amounted to \$179,028 in fiscal year 2003-04.

1. THE SOLID WASTE DIVISION IS AUTHORIZED 87 POSITIONS.

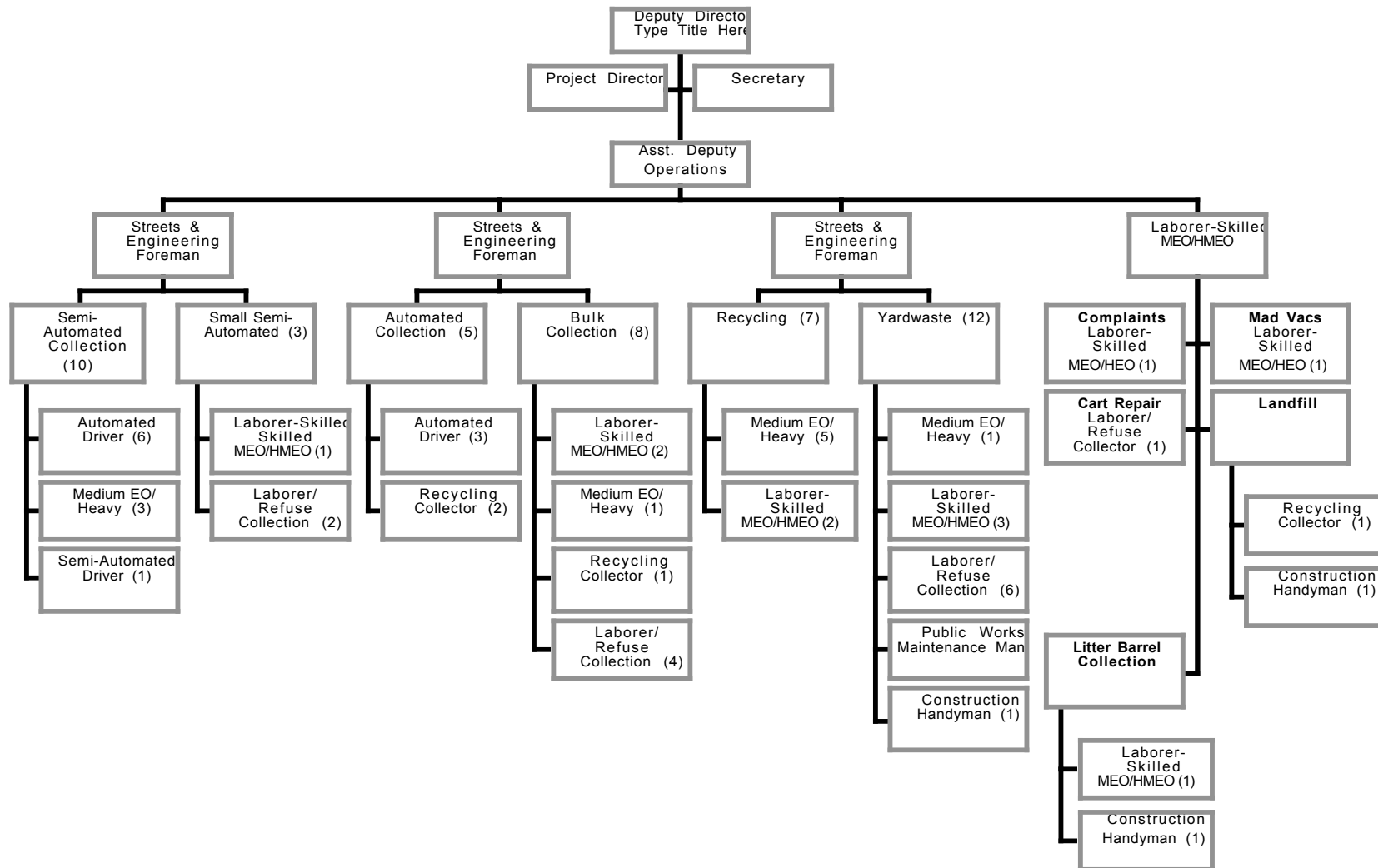
The Solid Waste Division is authorized 87 positions excluding the staff allocated to the Clean Cities Section and the Customer Service Center Section, whose positions are budgeted in the Solid Waste Division. These two sections are authorized staff as portrayed below.

- **There are five filled positions budgeted in the Solid Waste Division that are assigned to the Customer Service Center:** a Senior Clerk Typist, and four Customer Service Representatives (one of these four Customer Service Representatives is “on loan” to the Stores Section). There is also a vacant Customer Service Representative budgeted in Public Works Administration.
- **There are eight filled positions assigned to the Clean Cities Section that are budgeted in the Solid Waste Division** including three Building Maintenance Men, a Senior Customer Service Representative, a Skilled Laborer, a Construction Handyman, a Working Foreman Building maintenance Man, and a Working Foreman Skilled Laborer.

The current plan of organization for the Solid Waste Division is presented following this page. Important points to note regarding the plan of organization are presented below.

- **There are 17 positions vacant at the present time.** These include 10 Laborer/Refuse Collection positions, 1 Recycling Collector position, 2 Medium Equipment Operator/Heavy positions, and 4 Automated Driver positions. These positions are not portrayed in the plan of organization.
- **There 7 positions on workers compensation on temporary alternative work program.** This includes 1 Construction Handyman position (TAWP), 1 Laborer/Refuse Collection position (WC), 2 Laborer-Skilled/MEO/HEO positions (WC), 1 MEO/Heavy position (TAWP), and 2 MEO/Heavy positions (WC). These positions are not portrayed in the plan of organization.
- **There are 3 positions that function as “floaters: to cover leave.** This includes 2 MEO/Heavy positions and 1 Laborer-Skilled position. These positions are not portrayed in the plan of organization.
- **There is a total of 60 positions portrayed in the plan of organization.** These positions are primarily allocated among residential refuse collection, yard waste collection, bulk waste collection, and recycling collection.
- **18 of these 60 positions are allocated to residential refuse collection.** This includes 10 staff for semi-automated collection, 3 positions for small semi-automated collection, and 5 positions for automated collection. Over the last ten years, the tonnage collected by these crews has increased by 25% to 51,023 tons in 2004. This staff is assigned to collection routes as presented below.
 - **10 staff are assigned to semi-automated collection.** This staff is assigned to 10-routes Tuesday through Friday using the 4/10-plan. Each of these routes is staffed with 1-person crews. Semi-automated collection crews use 29-yard side-loader trucks with a capacity of 12 tons. Semi-automated collection is provided on a weekly basis. The households served by semi-automated collection amount to 28,146; 65% of the single-family households are served by semi-automated collection. The average number of households per route per day amounts to an average of 703. In fiscal year 2003-04, the staff using semi-automated collection vehicles collected 33,201 tons. This equates to approximately 16 tons per route per day. These crews typically make two trips to the waste-to-energy facility each day to dispose of the collected refuse.

Current Plan of Organization of the Solid Waste Division



- **The 3 staff assigned to the small semi-automated crew collects waste from areas that are difficult to collect for larger equipment** such as dead end streets and also from complaints (missed stops). This is a 3-person crew. This crew uses a 16-year rear loader truck with a capacity of 5.5 tons. These crews typically make two trips to the waste-to-energy facility each day to dispose of the collected refuse. During the month of June 2004, this crew collected an average of 7.6 tons of refuse per day, with a median of 6.5 tons per day, and a range from 4.8 tons per day as a low and 11.7 tons as a high per day. This crew uses a 5/8-work plan, and collects recycled materials on Monday and then collects refuse Tuesday through Friday.
- **5 staff are assigned to automated collection.** Each of these routes is staffed with 1-person crews. Automated collection crews use 33-yard side-loader trucks with a capacity of 15.5 tons. Automated collection is provided on a weekly basis. There are 5 routes Tuesday through Thursday and 4 routes on Friday; these routes are provided service using a 4/10-plan. The households served by automated collection amounts to 15,437; 35% of the single-family households are served by automated collection. The average number of households per automated collection route amounts to an average of 812. In fiscal year 2003-04, the staff using automated collection vehicles collected 17,234 tons. This equates to approximately 17.4 tons per route per day. These crews typically make two trips to the waste-to-energy facility each day to dispose of the collected refuse.
- **8 staff are assigned to bulk collection.** Bulk refuse is collected from Tuesday through Friday using a 4/10-work plan. 2-person crews are utilized. Residents call the Customer Service Center to schedule bulk collection, and the Center develops a route for collection. The crews travel these routes twice: once for bulk waste collection and the second time for metal waste collection. Bulk collection uses three-axle dump trucks with a capacity of 7.75 tons. In the week of July 13, 2004, there were 3 routes for 3 days and 4 on the fourth day. In the week of December 14, 2004, there were 3 routes for each of the 4 days. 606 households requested bulk waste collection for the week of July 20, 2004 or an average of 151 per day. In the week of December 7, 2004, 508 households requested bulk waste collection or an average of 127 per day or 16% less than in July. The average number of households requesting bulk collection per month amounted to an average of 2,309 for the months of April 2004 through February 2005. The peak was June with a total of 2,931; the low was January with 1,155. Approximately 3% did not have bulk collection stickers, and 21% did not place the bulk waste for collection at the scheduled day. In fiscal year 2003-04, the staff using bulk collection vehicles collected 1,295 tons of bulk waste and 677 tons of metal. Over the last ten years, the tonnage collected by these crews has increased by 62% to 1,316 tons in 2004. The tonnage decreased by 43% in 2004

compared to 2003 when the City instituted a bulk collection fee. These crews also collected 677 tons of metal in 2004.

- **7 staff are allocated to recycled waste collection.** Recycled materials are collected from Tuesday through Friday using a 4/10-work plan. 1-person crews are utilized. Recycling crews use 31-yard truck with a capacity of 3.5 tons. Recycling collection is provided on a two-week cycle. There are 5 routes on Thursday and Friday, and 7 routes on Wednesday. On Tuesday, there are 5 routes on one of the two-week cycles and 6 on the other week. The daily average number of households per route amounts to an average of 1,062. In fiscal year 2003-04, the recycling crews collected 5,412 tons. This equates to 4.7 tons per route per day. The City receives \$15.67 per ton of recycled waste. The recycled waste is delivered to the Materials Recovery Facility. The City has just signed a ten-year contract for operation of the Materials Recovery Facility with Recycle America Alliance, LLC. The City uses a dual stream recycling collection system. . Over the last ten years, the tonnage collected by these crews has decreased by 18% to 5,520 tons in 2004, although the tonnage has begun to increase over the past 3 years.
- **12 staff are allocated to yard waste.** Yard waste refuse is collected from Tuesday through Friday using a 4/10-work plan. 3-person crews are utilized. Yard waste collection crews use a 33-yard truck with a capacity of 16 tons. Yard waste collection is provided on a two-week cycle. There are 5 routes on Tuesday, Thursday, and Friday, and 7 routes on Wednesday. The daily average number of households per route amounts to an average of 1,062 per route. In fiscal year 2003-04, the staff using yard waste collection vehicles collected 10,291 tons. During the week of July 13, 2004, 3 crews collected yard waste each of the 4 workdays. During the week of December 14, 2004, 3 crews collected yard waste each of the 4 workdays. Yard waste is delivered to the City's compost site that is privately operated by Cover Technologies Inc. The City is charged \$5 per ton. . Over the last ten years, the tonnage collected by these crews has increased by 2% to 10,281 tons in 2004, but the tonnage has decreased significantly in some of these 10 years; in 1999, 8,414 tons were collected. In February and March of 2004, these crews collected no yard waste whatsoever, and little yard waste was collected from mid-December 2003 through the end of January 2004.
- **7 staff are allocated to miscellaneous duties.** These include the following:
 - 2 staff are allocated to the landfill at Bondi Island. The City owns this landfill. It currently has permitted capacity for 3 to 4 more years. The landfill currently accepts ash from the waste-to-energy facility. The 2 staff are responsible for the following tasks:
 - Maintenance of the leachate collection system and five pumping stations;

- Maintenance of the landfill gas collection system with 27 wells, 4 condensate knock out stations, and the flare station;
- Operation of the transfer area, i.e., transfer the white goods after freon removal, transfer mattresses, transfer tires, propane tanks, etc.;
- Deliver a recycling trailer to a large apartment complex and pick it up and deliver recyclables to the Material Recovery Facility;
- Maintenance of the truck wash station; and
- Maintenance of the landfill.

The Laborer-Skilled MEO/HEO that is assigned as an “acting” foreman is also assigned to the landfill.

- 1 staff is allocated to cart repair. In addition, the employee also handles citations for bulk on the tree belt without an appointment and distributing recycling blue boxes.
- 1 staff is allocated to complaints. This employee responds to complaints regarding dead dogs, spills in the road, vehicle accidents, minor litter complaints, etc. A 5/8-work plan is utilized. The complaint truck averages 8 calls per day.
- 1 staff is allocated to the Mad Vac program. The Division has two Mad Vac’s (small street sweepers) that are used for litter control in the business areas. Due to the number of vacancies and the extent of leave, the Division does not typically have sufficient staff to operate the Mad Vac’s.
- 2 staff are allocated to the litter barrel program using a 2-person crew with a rear loader. The crew works a 5/40-work plan. There are approximately 190 litter barrels throughout the City. The litter barrel operation is the first operation to be cancelled when the Division is short of personnel due to vacancies and leave.

In reviewing this staffing allocation portrayed in the plan of organization, there are a number of important factors to consider. These factors are presented below.

- **Only 32% of the filled positions portrayed in the plan of organization are allocated to residential refuse collection.** Only 19 of the 60 staff are allocated to residential refuse collection. This includes the employee allocated to cart repair.
- **50% of the filled positions portrayed in the plan of organization are allocated to bulk, yard waste, and recycled material collection.** 30 of the 60

positions are allocated to collection of waste other than residential refuse collection. This includes litter barrels and complaints.

- **13% of the filled positions portrayed in the plan of organization are allocated to administration.** This includes managers, supervisors, and support staff.
- **5% of the filled positions portrayed in the plan of organization are allocated to miscellaneous functions.** This includes the 2 staff assigned to the landfill and the 1 staff assigned to the Mad Vac program.

As noted previously, there are also three “floater” positions that are filled and that are utilized to cover the leave of staff assigned to residential refuse collection, bulk, yard waste, recycled material and other refuse collection.

There is one other important factor to consider. The Other Than Personal Services Budget for the Solid Waste Division amounts to \$5,450,796 in fiscal year 2005. Of this amount, \$3,434,000 is allocated for the tipping fee at the Waste to Energy facility. The tipping fee amounts to \$66.73 per ton. The amount of funds budgeted for tipping fees amounts to 41% of total fiscal year 2005 budget for the Solid Waste Division of \$8,374,796.

2. THE STAFF OF THE SOLID WASTE DIVISION HAVE AN AVAILABILITY FACTOR OF 69% AFTER CONSIDERING LEAVE.

The analysis of staffing for the Solid Waste Division must consider the amount of hours lost to leave such as sick leave, vacation leave, compensatory time, etc. The amount of hours lost to leave is significant as indicated in the table below. This data was developed based upon the report “Time Lost Report By Division” for the twelve-month period from January 2004 through December 2004.

| Type of Leave | 1/03/04 to 6/26/04 | 7/03/04 to 1/01/05 | Total |
|-----------------------------------|-----------------------|-----------------------|------------------|
| Vacation | 3,790.0 | 5,706.5 | 9,496.5 |
| Sick Leave | 2,442.0 | 2,040.5 | 4,482.5 |
| Holiday | 626.5 | 2,818.5 | 3,445.0 |
| Bereavement | 160.0 | 54.0 | 214.0 |
| Unauthorized Leave | 20.0 | 60.0 | 80.0 |
| Authorized Leave | 1,000.0 | 1,870.0 | 2,870.0 |
| Claims Sick | 1,394.0 | 1,095.0 | 2,489.0 |
| Military Leave | 90.0 | - | 90.0 |
| Compensatory Time | 4,617.0 | 5,582.0 | 10,199.0 |
| Incentive Days | 526.0 | 370.0 | 896.0 |
| Jury Duty | - | 120.0 | 120.0 |
| Tardy | 1.0 | 0.5 | 1.5 |
| Personal Leave | 423.0 | 299.5 | 722.5 |
| Suspension | 410.0 | 63.0 | 473.0 |
| Total Hours Lost To Leave | 15,499.5 | 20,079.5 | 35,579.0 |
| Number of Employees | 75.0 | 78.0 | |
| Available Work Hours | 78,000.0 | 81,120.0 | 159,120.0 |
| Net Work Hours After Leave | 62,500.5 | 61,040.5 | 123,541.0 |
| Availability % After Leave | 80.1% | 75.2% | 77.6% |

The net result of the amount of hours of leave is that each employee in the Solid Waste Division is available 77.6% of the total paid work hours or 1,614 hours annually. As a consequence, any route that needs to be collected each week will require 1.29 full-time equivalent staff to assure that sufficient backup staff is available to cover for leave. This is a somewhat higher level of leave than appropriate. Back-up rates typically range from 15% to 20% for leave. The backup rate for the Solid Waste Division amounts to 22.4%.

In addition, a vacancy factor must also be considered for the amount of time required to fill vacant positions (assuming a normal process and not a hiring freeze). The project team would suggest a vacancy factor of 9% - or 9% turnover annually. As a consequence, the route that needs to be collected each week will require an additional

0.09 full-time equivalent staff to assure that sufficient backup staff is available to cover for vacant positions.

The net impact is that each route that needs to be collected on an ongoing basis will require 1.38 full-time equivalent staff. As an example of the impact of this factor:

- There are 5 automated routes collected Tuesday through Thursday and 4 automated routes collected Friday;
- This is an average of 4.75 routes that must be collected each week; and
- Given the leave factor and vacancy factor, a total of 6.6 staff must be available for automated collection.

The project team, in conducting its analysis of the routes collected by the Solid Waste Division and the staffing required, utilized this leave and vacancy factor.

3. THE SOLID WASTE DIVISION SHOULD CEASE COLLECTING SOLID WASTE FOR CONDOMINIUMS AND FOR BUSINESSES AND ELIMINATE ONE SEMI-AUTOMATED COLLECTION ROUTE.

The Solid Waste Division collects solid waste from 405 businesses, and 129 apartment buildings. In addition, the Division contracts with Browning Ferris Industries to collect solid waste from 1,168 condominium units; the Solid Waste Division budgets \$100,000 for payments to Browning Ferris Industries to collect this solid waste.

The Law Department recently issued an opinion that the City is not legally obligated to collect solid waste from businesses, apartment buildings, or from condominiums.

The average number of households per semi-automated collection route amounts to 703. There are ten routes Tuesday through Friday. The Public Works Department should eliminate one of these ten routes and cease collecting solid waste

from the 405 businesses and 129 apartment buildings. This would enable elimination of a position and a side loader truck.

The Public Works Department should terminate its contract with Browning Ferris Industries to collect solid waste from 1,168 condominium units.

Recommendation: The City should provide 90-days notice to the 405 businesses, 129 apartment buildings and 1,168 condominium units of its intent to terminate the provision of solid waste collection services, and the need for the owners to arrange for private collection services at their own expense.

Recommendation. The Solid Waste Division should cease collecting solid waste from the 405 businesses and 129 apartment buildings.

Recommendation: The Solid Waste Division should eliminate one of its ten semi-automated collection route, and reduce staffing by 1.38 positions and reduce its side loader fleet by one truck.

Recommendation: The Solid Waste Division should terminate its contract with Browning Ferris Industries to collect solid waste from condominiums.

4. THE PUBLIC WORKS DEPARTMENT SHOULD EXPAND THE EXTENT OF AUTOMATED COLLECTION ROUTES.

The Public Works Department in Springfield is one of the few cities in Northeast United States that collects solid waste using automated collection vehicles. There are a number of important points to note concerning the automated solid waste collection system utilized by the Public Works Department.

- Automated collection uses 33-yard trucks with a capacity of 15.5 tons.
- Automated collection is provided on a weekly basis.
- There are five routes Tuesday through Thursday and four routes on Friday.
- The households served by automated collection amounts to 15,437. 35% of the single-family households are served by automated collection.
- The average number of households per automated collection route amounts to an average of 812, or 15.5% more than semi-automated collection routes.

- In fiscal year 2003-04, the staff using automated collection vehicles collected 17,234 tons. This equates to 17.4 tons per route per day.

While 35% of the residential solid waste is collected using automated solid waste collection vehicles, 65% of the solid waste is collected using semi-automated collection vehicles. The average number of households per automated collection route amounts to an average of 703, or 13.4% less than automated collection routes.

The interviews with the managers and supervisors of the Solid Waste Division indicated that there were opportunities to expand the extent of automated collection within the City – an estimated 2 to 3 additional routes per day. That would increase the number of automated collection routes from 19 routes each week to approximately 27 routes or 45% of the total residential collection routes. It would result in a reduction of the semi-automated routes from the current 40 routes each week to 32 routes or 55% of the total residential collection routes.

There are a number of benefits to the use of automated collection vehicles including the following:

- **Reduction of injuries to employees.** Studies in other cities have shown that the injury rates drop with the use of automated collection equipment. These reductions have amounted to 25% to 50%.
- **The use of automated collection equipment has enabled service delivery improvements.** These include the automation of yard waste collection by distributing another cart. Waterbury, for example, has begun using this approach. The use of automated collection equipment also enables the implementation of single stream recycling collection.

In summary, there are a number of advantages to the use of automated collection equipment. The Public Works Department has been utilizing automated collection equipment for approximately six years. The department should begin evaluating options to expand the use of automated collection equipment.

Recommendation: The Solid Waste Division should expand the number of automated collection routes.

5. THE NUMBER OF HOUSEHOLDS COLLECTED PER ROUTE PER DAY FOR AUTOMATED COLLECTION SHOULD BE INCREASED TO 950 TO 1,000.

The Solid Waste Divisions should also expand the number of households in each automated collection route. At present, the route size for automated collection equipment is an average of 812 households with a range of 715 households at the low end of the range and 905 households at the high end of the range. The average route size for semi-automated collection equipment is 703 with a range of 620 households at the low end of the range and 780 households at the high end of the range.

The use of automated collection equipment only results in an increase in route size and productivity of 15.5% more than semi-automated collection equipment. This is not a dramatic difference considering that the operator for the semi-automated collection equipment has to get out of the truck, walk to the trash container, drag the trash container to the equipment, use the “flipper” to empty the trash container, drag the trash container back to the previous location, and walk back to the semi-automated collection equipment.

The route size in other communities that have implemented automated collection equipment is greater than that of Springfield. The typical range for a fully automated residential collection system that operates on an eight-hour collection day is 700 to 900 households and 875 to 1,125 households for a ten-hour collection day such as that used by Springfield. This performance guideline is expressed as a range due to factors that vary from city to city. Examples of the factors include, but are not limited to, the following: (1) distances to and from transfer stations/landfills, fueling stations and

vehicle yards; (2) traffic; (3) policies regarding the collection of garbage outside of the container; and (4) physical constraints such as overhanging tree limbs and power lines, bar ditches, sunken curbs, etc.

The Public Works Department should expand the size of the routes for automated collection equipment with an objective of increasing the average route size to approximately 950 to 1,000 households per route.

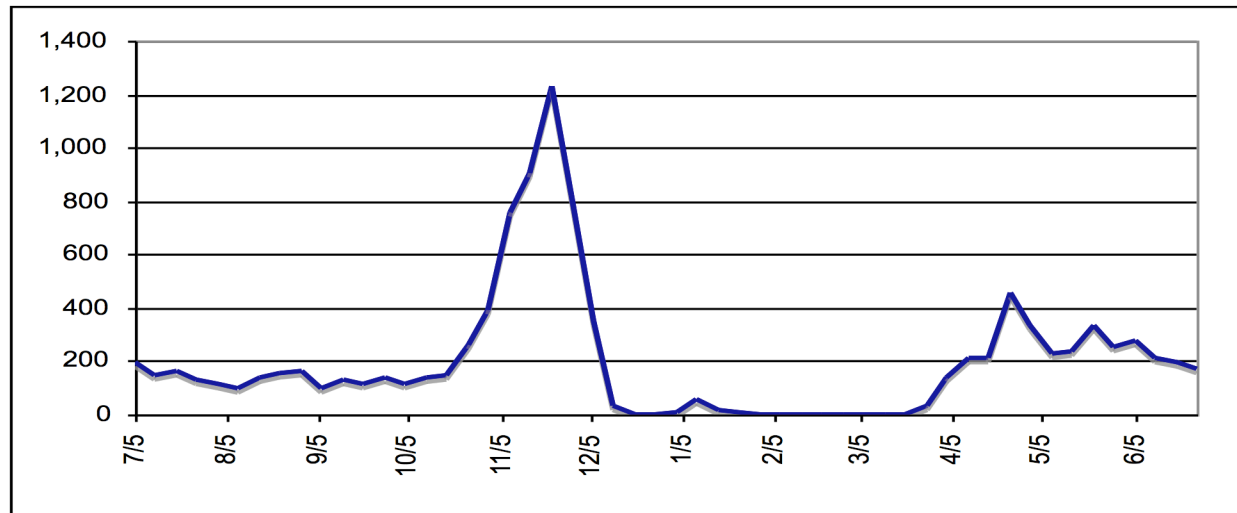
With an automated collection route of 950 to 1,000 households per day, it would be able to reduce the number of existing automated collection routes per week from 19 to approximately 16. This would enable the delivery of this service with four staff using the 4/10-work plan.

Recommendation: The Solid Waste Division should expand the size of the routes for automated collection equipment to a range of 950 to 1,000 households per route per day.

Recommendation: Reduce the staffing allocated to yard waste collection from 5 positions to 4 positions.

6. REDUCE THE CREW SIZE FOR YARD WASTE COLLECTION FROM THREE TO TWO STAFF AND SUPPLEMENT THESE STAFF WITH SUNDRY LABOR.

The collection of yard waste in Springfield clearly has seasonal variations. This seasonality is clearly portrayed in the chart below, which presents the tons of yard waste collected per week for fiscal year 2003-04.



Important points to note concerning the chart are presented below.

- From July through mid-October, the yard waste collection crews were collecting an average of 136 tons per week.
- Beginning in late October, the yard waste crews experienced a significant increase in tonnage that did not decrease significantly until mid-December. During this seven-week period, the yard waste crews collected an average of 672 tons per week with a peak of 1,227 tons during the week of November 22, and frequently worked six days a week.
- Beginning in mid-December, the yard waste crews collected little or no yard waste, and this workload did not change until the beginning of April. During this three and one-half month period, the yard waste crews collected an average of 10 tons per week. During eight of these weeks, no yard waste was collected whatsoever.
- Beginning in April, the yard waste collection workload increased. From the beginning of April until the end of June, the yard waste crews collected an average of 250 tons a week.

This data clearly indicates the seasonality of the yard waste collection workload.

The peak in workload occurs for seven to eight weeks beginning in late October. The valley in workload begins in mid-December, and persists until the end of March. During this three and one-half month period, there is little to no yard waste collection workload. For six and one-half months – July through mid-October and April through June, the

yard waste crews are collecting an average of 187 tons a week.

The second factor to consider is the high level of service provided by the Solid Waste Division in yard waste collection. In Springfield, yard waste is collected at the curb on a two-week cycle. While other cities in Massachusetts, such as Lawrence, provide this level of service, other cities provide seasonal service (spring and fall leaf collection) such as Shrewsbury and Arlington, while other cities such as Worcester and Concord provide drop-off service in which the resident can drop-off their yard waste at a city-operated compost facility.

The provision of this service at curbside is an effective approach to comply with the requirements of Mass. D.E.P. Regulation 310 CMR 19.017, which bans the disposal and transfer for disposal of certain yard waste at solid waste facilities in Massachusetts. Other cities, however, have chosen to recognize the seasonality of the workload and collect yard waste in the spring and fall, and to provide drop-off centers and composting bins as alternatives for the remainder of the year. However, the level of service provided by the Solid Waste Division exceeds the requirements of Mass. D.E.P. Regulation 310 CMR 19.017. This regulation requires that the municipality must ensure that leaves and yard waste are not collected or disposed of with solid waste. Municipalities must also meet A, B or C.

- A. The municipality has a combination of weekly curbside and/or drop-off composting programs for leaves and yard waste available to all residents April through November;
- B. The municipality provides curbside collection of leaves and yard waste at least 4 weeks in the spring and 4 weeks in the fall, and offers drop-off composting or distributes home composting bins and "don't trash the grass" brochures in the summer; or
- C. The municipality has enacted a by-law, ordinance or regulation, or has explicit

waste collection contract language, which mandates the source separation and composting of leaves and yard waste, and/or excludes them from collection.

The City provides weekly curbside collection of leaves and yard waste to all residents, but this service extended until mid-December in fiscal year 2003-04. In addition, the regulation does allow the City an alternative of provides curbside collection of leaves and yard waste at least 4 weeks in the spring and 4 weeks in the fall, and offers drop-off composting or distributes home composting bins and "don't trash the grass" brochures in the summer. The City has chosen to provide the most expensive alternative under these regulations. The City could elect to collect yard waste only during this 8-week period. However, it currently pays \$5 per ton to dispose or yard waste versus \$66.73 for disposal at the waste to energy plant. Given the 10,290 tons of yard waste collected on fiscal year 2003-04, the difference generated an annual cost savings of \$635,200. This cost savings is \$177,200 more than the cost of yard waste collection as estimated by the Solid Waste Division.

However, the seasonality suggests that the crew size can be reduced from three persons to two persons and supplemented by sundry labor during the peak season. The Solid Waste Division is using one-person crews for semi-automated collection of refuse; two-person crews for yard waste – supplemented by sundry labor during the peak season – would provide the necessary staffing and maintain current levels of collection. With the conversion to two-person crews, the staffing levels for yard waste should be reduced from 12 positions to 8.28 positions.

Recommendation: Reduce the crew size used for yard waste collection from three-persons to two persons.

Recommendation: Reduce the staffing allocated to yard waste collection from 12 positions to 8.28 positions.

7. MAD VAC SERVICE SHOULD BE PROVIDED BY THE DOWNTOWN BUSINESS IMPROVEMENT DISTRICT.

The Solid Waste Division provides Mad Vac services for the downtown. Mad Vac is a compact sweeper. The Division allocates a position to the operation of a compact sweeper to clean sidewalks, walkways, and streets in the downtown (although the number of vacancies in the Division result in this service rarely being provided).

If the downtown businesses desire a higher level of service, the Springfield Business Improvement District should provide and fund the service.

Recommendation: The Springfield Business Improvement District should provide the Mad Vac service for the downtown.

Recommendation: Allocate the two Mad Vac sweepers to the Springfield Business Improvement District.

8. THE LITTER BARREL COLLECTION SERVICE SHOULD BE PROVIDED WITH A ONE-PERSON CREW USING A SIDE LOADER COLLECTION TRUCK WITH A ONCE A WEEK SERVICE LEVEL.

The Solid waste Division allocates two staff and a rear loader collection truck to the collection of solid waste from litter barrels, mostly in the downtown. The staff that collect the refuse from these barrels are scheduled for Monday through Friday – 7:00 am to 3:30 pm. There are approximately 190 litter barrels throughout the City, mostly in the downtown. The litter barrel operation is the first operation to be cancelled when the Division is short of staff.

Recommendation: The crew size for the collection of refuse from barrels should be reduced to one person.

Recommendation: The refuse from these barrels should be collected using a side loader truck.

Recommendation: The refuse from these barrels should be collected once a week. If the downtown businesses desire a higher level of service, that service should be provided and funded by the Springfield Business Improvement District.

9. THE CREW SIZE FOR TRUCK 367 SHOULD BE REDUCED FROM THREE TO TWO.

Truck 367 is a 3-person crew (driver and two laborers) that is assigned to recycling on Monday, but on Tuesday through Friday to the collection of residential refuse from dead ends, one-way streets, alleys, missed stops, handle complaints (missed stops), etc.

This crew loses a significant amount of time to travel throughout the City. A crew size of 2-persons would be appropriate for Truck 367 given the amount of unproductive travel time. The use of a 2-person crew is not unusual in cities that collect residential refuse with rear loaders.

The reduction of the crew size of Truck 367 from three to two would enable the elimination of 1.38 positions.

Recommendation: Reduce the crew size of Truck 367 from 3-persons to 2-persons.

10. SEVENTEEN VACANT POSITIONS SHOULD BE ELIMINATED.

The table below presents the staffing requirements for the Solid Waste Division including the adjustments recommended previously in this chapter.

| Type of Collection | Routes | Crew Size | Leave/Vacancy factor | Total |
|---------------------------|---------------|------------------|-----------------------------|--------------|
| Automated | 4.0 | 1.0 | 1.38 | 5.5 |
| Semi-Automated | 9.0 | 1.0 | 1.38 | 12.4 |
| Truck 367 | 1.0 | 2.0 | 1.38 | 2.8 |
| Bulk | 3.0 | 2.0 | 1.38 | 8.3 |
| Recycled | 5.6 | 1.0 | 1.38 | 7.8 |
| Yard | 3.0 | 2.0 | 1.38 | 8.3 |
| Litter Barrels | 0.1 | 1.0 | 1.38 | 0.1 |
| Total Staffing | | | | 45.2 |

As the table indicates, the project team recommends the allocation of 45.2 staff to the collection of solid waste for automated, semi-automated, truck 367, bulk,

recycled, yard, and litter barrels. At present, the Division has 51 filled positions available for these collection services including the three “floaters.” The project team would recommend that the 51 filled positions be sustained to enable adjustments to seasonal workload and the recommended adjustments in crew sizes and route sizes contained within this chapter.

Recommendation: The seventeen vacant positions within the Solid Waste Division should be eliminated.

11. REDUCE THE WAIT TIMES FOR DUMPING LOADS AT THE WASTE TO ENERGY PLANT.

Currently, all residential collection routes start at the same time each morning. As a result, many of the collection vehicles travel to the waste to energy plant at the same times. Collection crews typically need to wait 20 minutes at the waste to energy plant before dumping their load. The Solid Waste Division should implement any of the following changes to reduce wait times:

- Stagger times when collection vehicles start their routes to reduce “bottlenecks” at the transfer station;
- Improve communications between drivers so that they have a better sense of when to travel to the transfer station; or
- Unload two vehicles per side at a time at the transfer station.

Recommendation: The Solid Waste Division should reduce wait times at the waste to energy plant for dumping loads.

12. THE CITY SHOULD INCREASE ITS FEES FOR BULK WASTE COLLECTION.

The City presently charges \$2 per item for bulk waste collection. In fiscal year 2003-04, the City collected \$179,028 in fees for bulk waste collection. Other cities charge a higher fee. East Longmeadow charges a minimum of \$50 with fees for a mattress, chair, carpet or couch, for example, ranging from \$30 to \$60. Longmeadow

also charges higher fees; \$10 is charged per unit for a mattress, chair, carpet or couch. Worcester charges \$12 for a couch, mattress, or rug, with higher fees for metals (\$23) such as a refrigerator.

The City of Springfield should increase its fees for bulk waste collection to \$12 per unit. The estimated increase in revenue would approximate \$500,000 annually.

Recommendation: The City of Springfield should increase its fees for bulk waste collection to \$12 per unit.

13. THE CITY SHOULD IMPLEMENT A PAY AS YOU THROW PROGRAM FOR SOLID WASTE SYSTEM.

A Pay-As-You-Throw program is a system in which residents pay for each unit of waste discarded rather than paying a fixed fee per residential household. It is equivalent to putting a price tag on each container of trash that is placed at the curb or taken to the Waste to Energy facility. As residents pay directly for waste disposal services, they have a financial incentive to reduce their waste through recycling, composting, and source reduction.

As of January 2005, there were 111 municipalities in Massachusetts that had implemented a Pay-As-You-Throw program; there have been 21 new PATYT programs in the past four years. These include comparably sized cities such as Brockton and Worcester as well as other cities such as Taunton, Bolton, Clinton, East Brookfield, Gardner, North Brookfield, Northborough, Phillipston, Royalston, Spencer, and Webster. The experience of these cities is that the amount of waste being disposed of at the landfill decreases by 25% to 35%. For Springfield, that could indicate the potential to reduce the annual costs of “tipping fees” by \$860,000 annually. It could also assist the City in addressing the significant increase in municipal refuse collected over the past ten

years. Over the last ten years, the tonnage of municipal refuse collected has increased by 25% to 51,023 tons in 2004.

The Massachusetts DEP has a number of recommendations for implementation of a PAYT program.

- Allow plenty of lead time - one to two years;
- Provide extensive outreach and education of elected officials, the general public, community groups, and the media;
- Conduct public forums regarding the PAYT program
- Provide a waiver or subsidy for fixed income residents; and
- Establish enforcement guidelines for illegal dumping and resident non-compliance.

The Massachusetts DEP will provide technical assistance throughout the PAYT process. In addition, the Massachusetts will provide grants for new PAYT programs of up to \$5 per household with a cap of \$100,000. These funds are provided for start-up and implementation.

Recommendation: The City should seek technical assistance from Massachusetts DEP in the implementation of the PAYT program.

Recommendation: The City should apply for a grant from Massachusetts DEP for start-up and implementation of the PAYT program in Springfield.

Recommendation: The City should implement a PAYT program.

14. THE PUBLIC WORKS DEPARTMENT SHOULD PREPARE AND ISSUE A REQUEST FOR PROPOSAL FOR SOLID WASTE COLLECTION.

Today, the private sector provides over three-quarters of solid waste services in the United States. There are four reasons why local governments should consider privatizing solid waste collection.

- **Lower costs.** Cities typically reduce their costs by at least 20% by privatizing their total cost for waste disposal. A survey by the Mercer group found that 100% of the cities that privatized their solid waste collection saved money.
- **Quality of service.** Introducing competition enables cities to provide incentives to enhance the quality of service. According to the survey of the Mercer Group, 45% of the respondents indicated that quality of work was a key factor.
- **Management flexibility.** Competitive delivery of services provides greater incentive and flexibility to use smaller crews, and keep leave and worker's compensation rates low.
- **Risk Sharing.** Public-private partnerships routinely require the private company to assume primary responsibility for general liability, and financial guarantees.

Managed competition is the most significant recent trend in privatization of solid waste collection. In managed competition, the Solid waste Division would compete and submit a proposal. Managed Competition enables government to test the market by allowing both public and private entities to compete for a contract through an RFP process.

The best candidates for managed competition are those services for which a bustling competitive market already exists. If properly implemented, Managed Competition, or competitive sourcing, as it is also known, can invigorate service delivery, enhance the general perception of public service, and translate into annual savings in the range of 10 to 30 per cent. The key phrase, however, is "properly implemented." Although converting to managed competition is not a simple process, the good news is that plenty of working models exist in cities such as Phoenix, Arizona and Charlotte North Carolina, where ambitious programs have been in existence for years.

In Springfield's current cost environment, exploring Managed Competition for solid waste collection may be a solution to achieving significant savings and service quality improvements. This would offer multiple private firms the opportunity to bid to

deliver a particular service. To attract competitive and quality bidders, the playing field must be - and must appear to be - reasonable and fair. Private firms should not feel that public entities have the inside track. Key learning from the post-implementation of Managed Competition programs in various jurisdictions includes the following:

- **It's not a "one size fits all" proposition.** Services and their method of delivery are different, and frequently require unique approaches. As a report from Charlotte, NC explains, "Some [services] are equipment intensive and some are labor intensive so the same approach in costing, RFP development, performance criteria and gainsharing will not work for all." On the positive side, experience exists for virtually every service—so the time-consuming process of starting from scratch can usually be bypassed.
- **Employees and unions have to be involved from the start.** Given their role as key stakeholders in this change exercise, it's critical—from both a process and substantive outcome perspective—that public sector unions take an active role in the design of any new procurement process. To better achieve buy-in, decisions shouldn't be presented in a "review and comment" scenario.
- **Performance should be benchmarked.** Managed Competition is not simply about replacing one service provider with another for the sake of a change. The determining decision factors are efficiency, innovation and service responsiveness. To better assess results, especially at early stages, initial competitive contracts should be for a portion of a larger market. Segmenting a service will enable government to consider the lessons of experience for subsequent contracting rounds.
- **The relative success of a Managed Competition program rests entirely on a government's ability to define, adhere to, and monitor clear standards of implementation**—with the ultimate goal of harnessing the creative energies that are released in a move away from monopoly service delivery. To increase the likelihood of success, some prudent guidelines for adopting a Managed Competition program include fair competition.
- **The gains to the public are directly derived from the quality proposals and implementation that a competitive process is expected to produce from both public and private organizations.** The process for fostering this competition must provide structured and consistent methods for achieving "all-in costing" or "full cost pricing." The complete cost of replacing or creating public services, including attribution of items like maintenance and capital expense, must be considered.

As experienced in Charlotte, “the single most important achievement of managed competition has been the development of a culture in which government is run like a business.”

Recommendation: The City should prepare and issue a Request for proposal for solid waste collection services using a managed competition approach.

9. STREETS DIVISION

9. STREETS DIVISION

The Streets Division provides a wide variety of services in the maintenance and repair of the City's streets. These services include street sweeping, the preparation of roadways for contractual overlay, sidewalk repair and replacement, the patching of asphalt potholes, cracks and other failures, and the removal of snow from streets. The Streets Division is authorized seventy-three positions; twenty-six of these positions are vacant at the present time.

1. THE PUBLIC WORKS DEPARTMENT SHOULD ISSUE A REQUEST FOR PROPOSAL FOR STREET SWEEPING SERVICES.

The Public Works Department provides street sweeping services with eight staff. Typically, four of these eight staff are assigned to street sweepers, two staff are assigned to dump trucks to pick up the sweeper debris, one staff is assigned to a street flusher, and one staff maintains and repairs the sweepers.

Although the Springfield Streets Division does not have precise records regarding the actual number of curb miles swept in the City, it estimates that there are between 1,000 and 1,100. The Division has historically attempted to accomplish 6 sweeping cycles per year. However last year, it was in the middle of its third cycle when the sweeping season ended.

The Streets Division provides the first sweeping cycle of the season in a "tandem" method, whereby one street sweeper directly follows another in an attempt to remove as much sand and salt as possible. After the first sweeping cycle, the Division assigns four sweepers to individual routes. The Division pairs two sweepers with a single dump truck which "shuttles" between the two, collecting and disposing of debris

collected by the two sweepers. Further, during heavy dust periods, the Division places a street flusher truck in front of each sweeper to spray water to mitigate dust clouds.

This is a costly service, as it is in most locations in which sand is utilized for snow and ice control. However, the sweeping operation in the Public Works Department has a relatively higher cost, lower level of service, and lower productivity than that usually experienced by the project team.

To document the current cost, the project team completed a cost build-up on an hourly basis. The following table summarizes these costs.

| Element | Number |
|--|----------------|
| Hourly Depreciation of Equipment | \$37.76 |
| Personnel Costs (Direct labor plus 33% benefits) | \$27.03 |
| Maintenance and Repair | \$4.52 |
| Fuel | \$1.12 |
| Total Hourly Cost | \$70.43 |

In developing these costs, the project team made the assumptions presented below.

- **The cost of a new street sweeper is approximately \$110,000, with a replacement cycle of 6 years.** The annual depreciation is \$18,333.
- **The cost of a new dump truck is approximately \$65,000, with a replacement cycle of 10 years.** The annual depreciation is therefore \$6,500. Since one dump truck is assigned to two sweepers, the project team has, for purposes of the development of the cost per hour associated with one sweeper, assumed that the depreciation associated with one dump truck is one-half of the calculated total, or \$3,250.
- **The labor cost of sweeper and dump truck operation is assumed to be \$13.55 per hour, which is the direct rate associated with a Skilled Laborer/MEO in the data provided by the Public Works Department.** In addition to this hourly cost is added an assumed 33% for fringe benefits.
- **To determine the cost associated with repair and maintenance of sweepers and dump trucks, the project team analyzed actual service records for a sample of 11 dump trucks and 6 sweepers.** The average number of maintenance and repair hours for dump trucks was 106.32 hours annually, and for sweepers, the figure was 41.67 hours during FY 2004. (The project team should note that, although the actual data was utilized, the average number of maintenance hours for sweepers appears extremely low, only about 6 hours of

maintenance per month during the seven-month sweeping season – a low total for an extremely maintenance-intensive piece of equipment.)

- **The hourly cost for maintenance and repair was assumed to be \$55.00 per hour.** Although for reporting purposes, the Garage reflects only direct labor costs, this does not represent the true total cost of operation. In addition to this direct cost are the indirect costs of foremen, manager and parts room personnel. Further, there is some cost associated with the provision of the automated fuel dispensing system, and department-wide overhead. Although the project team did not calculate the actual cost of service at the Springfield Garage, comparable rates provided by private industry are in the range of \$60 to \$70 per hour. The project team utilized a conservative rate of \$55 per hour for this calculation, however.
- **Fuel costs were assumed to at \$1.90 per gallon.** The project team calculated that each sweeper attains a 5 miles per gallon fuel consumption rate, and each dump truck achieves 7 miles per gallon. Records provided by the department indicate that, during the months of March and July 2004, each sweeper traveled an average of 5.95 linear miles, or an average consumption of 1.19 gallons per day. Assuming that each day consists of 7 hours of service, this amounts to 0.17 gallons consumed per hour, and an hourly fuel cost of \$0.323. Similar calculations for the fuel cost of dump trucks equates to \$0.798 per hour, for a total hourly fuel consumption cost of \$1.121. The amount of linear miles swept per sweeper operator per day is less than one-half the level of productivity that the project team expects as a metric for this service.
- **Records for March and July 2004 indicate that, of the 6 available sweepers, an average 3.5 were on the road each day.** This equates to 58.33% of sweepers on the road during the average day during sweeping season. For purposes of cost calculation, the sweeping season was assumed to be 7 months long, with each month containing an average of 20 working days. This equates to 140 working days. Assuming that each sweeper is on the road 58% of the time, this amounts to an average of about 81 days on the road for the “average” sweeper. This was the figure utilized to determine the cost for purposes of the calculation of annual depreciation.

The result of this analysis indicates that the cost to the City of providing street sweeping services amounts to approximately \$70 per hour.

There are a number of reasons why the City should consider issuance of a request for proposal for street sweeping services. These reasons are presented below.

- This hourly cost for street sweeping services in the Streets Division is higher than another City in Massachusetts that contracts for street sweeping service.

- The Streets Division provides a service that most cities no longer provide: street flushing.
- The Division also faces the immediate need to replace street sweepers that have long exceeded their replacement cycle. The costs of replacing the front-line street sweepers will likely approach \$500,000.
- The Division provides its own sweeper mechanic, although the workload associated with the maintenance of this equipment has already been considered in the staffing for the Garage Division.
- The level of productivity of the sweeper operators in the Streets Division is less than one-half the metric that the project team utilizes and that other cities meet.
- The level of service provided for street sweeping by the Streets Division is lower than the metric utilized by the project team and lower than other cities in the northeast United States.

Recommendation: The City should issue a request for proposal for street sweeping services.

2. THE STAFF ALLOCATED TO THE YARD CREW SHOULD BE REASSIGNED TO ROUTINE PAVEMENT MAINTENANCE.

Three staff are allocated to a “yard crew” at 70 Tapley Street. These staff, and their roles and responsibilities, are presented below.

| | | |
|-----------------------------|---|---|
| Foreman | 1 | <ul style="list-style-type: none">• Oversees and directs the activities of crew members in the Sweepers Section as well as those in the Yards Section, whose duties are described below.• Plans and schedules work of employees.• Ensures safety of work sites and ensures availability of materials for crews. |
| Special Heavy MEO | 1 | <ul style="list-style-type: none">• Operates backhoe in Yard.• Cleans up around Yard.• Loads trucks entering Yard with gravel, loam, etc., for return to respective work sites. |
| Working Maintenance Foreman | 1 | <ul style="list-style-type: none">• Has responsibility for oversight and supervision of the Yard/workshop.• Completes small projects (e.g., assembling frames for No Parking signs, building barricades, etc.)• Fills in for absent workers on other crews. |

These three positions should be reallocated to routine pavement maintenance in the field. The basis for this recommendation is presented below.

- The Skilled Laborers/MEO’s driving trucks to and from the yard can operate a front -end loader to fill their dump trucks.

- A Working Maintenance Foreman for supervision of the yard and the workshop is unnecessary if there isn't any staff at the yard as the project team recommends. The position also completes small projects such as assembling frames for "No parking" signs, building barricades, etc. This would be excellent work during the winter when conditions prevent pavement maintenance. A position does not need to be dedicated to this service on a year-round basis.
- The Foreman that supervises the staff assigned to street sweeping and the yard. The street sweeping is a routine activity that should require little supervision. Another foreman can provide what supervision is required for street sweeping.

These staff assigned to the Streets Division should be in the field performing routine pavement maintenance, not in the yard.

Recommendation: The three positions assigned to the "yard" at 70 Tapley Street should be reallocated to routine pavement maintenance in the field.

3. THE CITY SHOULD OUTSOURCE OVERLAY PREPARATION AND SIDEWALK REPLACEMENT.

The Streets Division allocates a significant number of staff to street overlay preparation and sidewalk replacement/repair. This includes ten staff: a Foreman, two Working Maintenance Foreman, four Maintenance Craftsman, two Skilled Laborer/MEO's, and a Special Heavy/MEO. The work activities performed by these staff includes tearing out existing asphalt, laying and rolling base material, pouring new concrete curbing, installing wheelchair ramps at intersections for ADA compliance, digging up gates and making manhole adjustments, and other related activities. The contractor then completes the asphalt overlay.

The Streets Division is not allocating significant amount of staff hours to sidewalk replacement and repair. Data generated by the legacy financial and human resource information system indicates that the Streets Division allocated the following amount of hours to sidewalk replacement in fiscal year 2003 – 04.

| Funding Source | Regular Hours | Overtime Hours | Total Hours |
|-----------------------|----------------------|-----------------------|--------------------|
| Chapter 90 | 306 | 28 | 334 |
| Chapter 235 | 162 | 1 | 163 |
| TOTAL | 468 | 29 | 497 |

As the data in the table indicates, the Streets Division allocated 497 labor hours to sidewalk replacement. Many of these hours are likely sidewalk repair in which the crew patches the sidewalk as a temporary repair with asphalt.

The Streets Division also allocated labor hours to the preparation of the streets for overlay by contractors. These activities include tearing out existing asphalt, laying and rolling base material, pouring new concrete curbing, installing wheelchair ramps at intersections, digging up gates and making manhole adjustments, and other related activities. The contractor then completes the asphalt overlay. Data from the legacy financial and human resource information system indicates that the Streets Division allocated the following hours of labor to these functions in FY 2003-2004:

| Funding Source | Regular Hours | Overtime Hours | Total Hours |
|-----------------------|----------------------|-----------------------|--------------------|
| Chapter 90 | 1,423.5 | 196.0 | 1,619.5 |
| Chapter 235 | 4,112.5 | 139.5 | 4,252.0 |
| TOTAL | 5,536.0 | 335.5 | 5,871.5 |

The 5,871.5 total hours amounts to a little more than three staff.

Overall, while the Streets Division has allocated ten staff to overlay preparation and sidewalk replacement and repair, the legacy financial and human resource information system indicates that 6,004 regular hours were allocated to these two work activities in FY 2003-04.

The project team recommends that the City outsource sidewalk replacement including the installation of handicap ramps. Sidewalk replacement should be outsourced to the contractor performing sidewalk replacement as part of the capital improvement program.

The project team recommends that the City outsource overlay preparation to the contractor awarded the bid for the overlay. This would include base repair, pouring new concrete curbing, digging up gates and making manhole adjustments, and other related activities.

Recommendation: The City should outsource sidewalk replacement to the contractor performing sidewalk replacement as part of the capital improvement program.

Recommendation: The City should outsource overlay preparation to the contractor awarded the bid for the overlay.

4. THE WORK METHODS USED FOR UTILITY CUT REPAIR SHOULD BE MODIFIED.

The quality of utility cut repairs is essential to the life of pavement. More specifically:

- Results show that the presence of utility cuts in the roadway results in lower measured pavement condition scores compared to pavements of the same age with no utility cuts.
- Studies have demonstrated the link between the extent of utility cuts and accelerated pavement deterioration. The accelerated pavement deterioration is linked to reduction of pavement life.
- A recent study by a large city concedes that high quality workmanship in the repair of utility trenches may reduce the structural damage to pavements, but contends that lower ride quality, increased cracking still result and therefore service lives are diminished.
- Deflection testing in areas adjacent to the utility trenches have shown that trenching operations reduce pavement strengths in a zone from 3 to 6 feet either side of the centerline of the trench.
- The economic impact of utility cuts is often calculated based on the increased thickness of overlay required to compensate for the presence of the utility cut.

While quality of utility cut repairs is important, the cost-effectiveness of these repairs is also important. The Streets Division uses a process for utility cut repairs that

involves two crews, and is not cost-effective. In February 2005, these two crews completed 27 utility cuts. The process used by these two crews is presented below.

- One crew – the “digout” crew – removes the temporary material in the utility cut. The crew consists of three staff and is equipped with a dump truck, backhoe, and pickup truck
- A second crew – the patch crew – follows the “digout” crew about one-half hour to one hour behind and places a permanent patch in the utility cut. This crew consists of three staff and is equipped with a dump truck with trailer, asphalt roller, and pickup truck.

This process should be reengineered. Only one crew should travel to the utility cut, excavate the temporary material in the utility cut, and place a permanent patch. This crew should be assigned a dump truck, asphalt roller and backhoe. The crew should be assigned three staff. One crew should be sufficient if the workload is comparable to February 2005, but this one crew may need to be supplemented with a second crew during the construction season.

Recommendation: Reengineer the utility cut patch process so that one crew removes the temporary patch and replaces it with a permanent patch.

5. THE CREW SIZE USED FOR POTHOLE PATCHING SHOULD BE REDUCED TO TWO PERSONS.

At present, the Streets Division uses a 3-person crew for pothole patching. This crew uses a pickup truck and a dump truck. The size of the crew should be reduced to 2-persons. This crew should utilize a dump truck only, and the pickup truck should be disposed.

Recommendation: The crew size for pothole patching should be reduced from three to two persons.

6. THE STREETS DIVISION SHOULD FOCUS ITS STAFF ON ROUTINE PAVEMENT MAINTENANCE AND INSOURCE CRACK SEALING.

The Streets Division should focus its staff on routine pavement maintenance including pothole patching, skin patching, base repair, and should insource crack sealing. The Division allocates only four staff to routine pavement maintenance: a 3-person crew allocated to pothole patching and 1-person crew to pothole patching. The Division does not routinely provide base repair, skin patching, and contracts crack sealing.

The allocation of four staff, in the project teams analysis, is not sufficient staffing to preventively maintain and repair the City's streets.

The estimated annual workload for pothole patching, skin patching, base repair, and crack sealing is presented in the exhibit on the following page. Important points to note concerning the data contained within the exhibit are presented below.

- There are an estimated 343 crew days required for pothole patching. This work activity should use a 2-person crew, and not the 3-person crew currently utilized by the City. This activity would be performed 8 months a year (April through November), and would require two crews.
- There are an estimated 339 crew days required for skin patching. This work activity should use a 4-person crew. This activity would be performed eight months a year (April through November), and would require two to three crews during this seven-month period.
- There are an estimated 99 crew days required for base repair. This work would be performed using a 4-person crew. This activity would be performed eight months a year (April through November), and would require one crew approximately 70% of each month for these seven months.
- The Public Works Department should insource crack sealing. This work would be performed using a 4-person crew. This activity would be performed during cooler months such as April, October and November. This would require one crew during these three months. The cost of this contract approximates \$200,000 annually.

Estimated Annual Work Program for Routine Pavement Maintenance

| Activity Name | Inventory Measure | Units | Annual Quantity | | AWQ | ADP | Crew Days | Crew Size | Staff Days |
|---------------------|-------------------|-------|-----------------|------|--------|-------|-----------|-----------|------------|
| | | | Per Inventory | Unit | | | | | |
| Pothole Patching | 2-lane miles | 932 | Tons Mix | 1.0 | 960 | 2.8 | 342.8 | 2 | 685.7 |
| Skin Patching | 2-lane miles | 932 | Square Yards | 40.0 | 37,280 | 110.0 | 338.9 | 4 | 1,355.6 |
| Base Repair | 2-lane miles | 932 | Square Yards | 6.9 | 6,431 | 65.0 | 98.9 | 4 | 395.7 |
| Crack/Joint Sealing | 2-lane miles | 932 | Pounds Sealant | 26.3 | 24,512 | 350.0 | 70.0 | 4 | 280.1 |
| | | | | | | | | | 2,717.2 |

The Streets Division should also continue to patch utility cuts. This requires approximately three staff years.

These pavement maintenance work activities recommended by the project team would require additional staff beyond the four-staff allocated by the Streets Division. The total staffing required to complete these work activities, including utility cut patching, approximates twenty-three positions including Working Maintenance Foreman, but excluding Foreman. (Two Foremen would be required for the supervision of these staff).

Recommendation: The Public Works Department should allocate twenty-three staff to routine ongoing pavement maintenance including pothole patching, skin patching, base repair, and crack sealing.

Recommendation: The Public Works Department should insource crack sealing.

7. THE ALLOCATION OF THREE STAFF TO 24-HOURS COVERAGE OF THE PUBLIC WORKS DEPARTMENT YARD AT 70 TAPLEY STREET DURING THE WINTER MONTHS SHOULD BE MODIFIED.

The Public Works Department provides continuous, 24-hour coverage at the Tapley Street facility during winter months to respond to emergency calls, and to patrol the City for conditions requiring immediate attention by the department. The crew assigned to this coverage consists of a Maintenance Craftsman, a Laborer and a Skilled Laborer/Motor Equipment Operator. These three staff members perform a variety of duties, however they primarily relate to checking the City for freezing conditions (focusing to a large degree upon areas around car washes and other roads where standing water may turn to ice), picking up dead animals, sweeping up glass after accidents, checking mains in front of houses, placing “No Parking” signs, reporting damaged or inoperable lights and signals, and other related duties.

The staffing for this program should be reduced so that only the swing shift and graveyard shift are covered on weekdays, while continuing to provide 24-hour coverage on weekends.

Recommendation: The Public Works Department should modify the provision of the 24-hour coverage during winter months.

8. THE TWENTY-SIX VACANT POSITIONS IN THE STREETS DIVISION SHOULD BE ELIMINATED.

There are 26-vacant positions in the Streets Division as of April 12, 2005. The preceding analysis indicates that the existing number of filled positions within the Streets Division should be capable of delivering routine pavement maintenance for the streets of Springfield including pothole patching, skin patching, base repair (digout and rebase), crack/joint sealing, and utility cut patching.

The 26-vacant positions within the Streets Division should be eliminated. These include the following positions:

- 1 Principal Clerk Typist;
- 6 Construction Handyman;
- 3 Public Works Maintenance Men;
- 2 Skilled Laborers;
- 2 Working Foreman Skilled Laborer;
- 6 Maintenance Craftsmen;
- 1 Working Maintenance Foremen;
- 1 Skilled Laborer/MEO; and
- 4 Heavy/MEO.

Recommendation: Twenty-six vacant positions in the Streets Division should be eliminated.

10. TOWING AND STORAGE DIVISION

10. TOWING AND STORAGE DIVISION

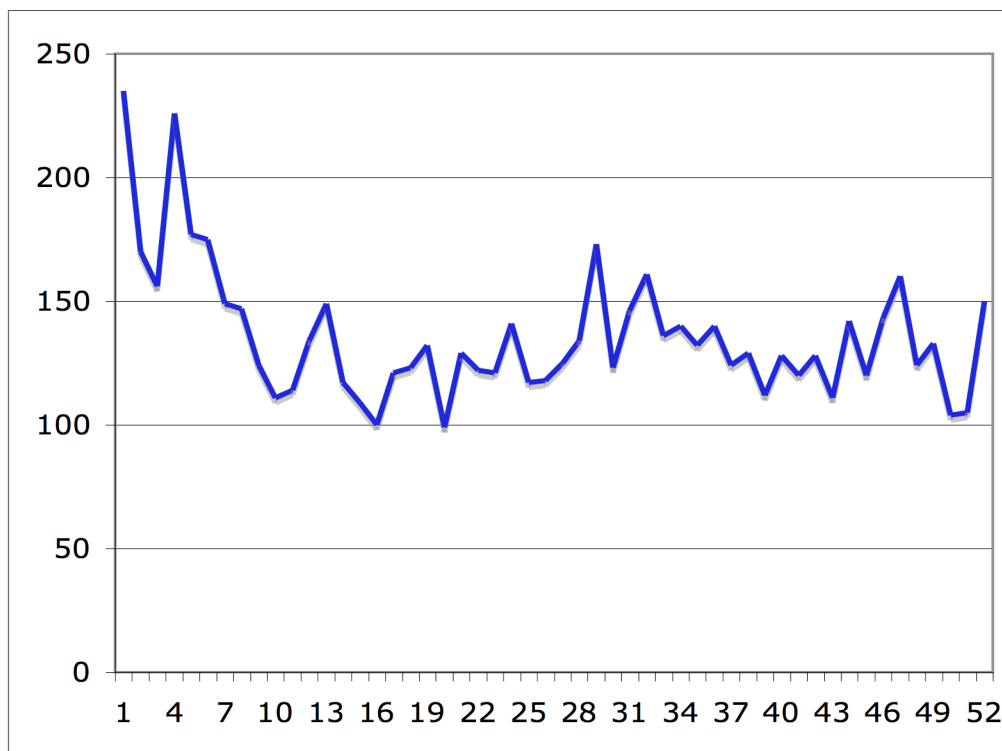
This chapter presents an analysis of the Towing and Storage Division. This analysis includes the cost recovery by the division or the extent to which the revenues generated by the division exceed costs, and whether the Public Works Department should continue to provide this service. In considering this service, it is important to note that the division is largely in the business of storage, and not towing, of vehicles.

1. ON AVERAGE, THE TOWING AND STORAGE DIVISION RECEIVED 1.2 TOWED VEHICLES PER HOUR.

CJ's Towing Unlimited has been awarded the contract for all tows ordered by the Police Department. The contract expires in October 2005. The contract requires that all tows ordered by the Police Department be towed to the towing and storage facility operated by the Public Works Department from 7 AM to 11 PM Monday through Sunday. All vehicles towed by CJ's Towing from 11 PM until 7 AM are towed to the lot operated by CJ's Towing, when the towing and storage facility operated by the Public Works Department is closed. CJ's Towing retains the fees collected for the storage of these vehicles. CJ's Towing is, however, required to pay the City a \$30 administration fee for every vehicle reclaimed by its owner.

The Towing and Storage Facility received 7,059 vehicles in 2004 from CJ's Towing. On average, the Division received 136 vehicles a week, 19 vehicles per hour or 1.2 vehicles per hour. The minimum number of vehicles received in any week in 2004 was 99, while the maximum was 235. The table at the top of the next page presents the number of vehicles received by the Towing and Storage Division for 2004. As the chart

indicates, the number of vehicles received typically ranged between 100 to 150 vehicles per week or 14 to 21 vehicles per 16-hour day that the division is open for business.



Owners pick up an estimated 75% of the vehicles within 2 to 3 days of tow. The remaining vehicles must be stored until the costs of storage exceed the value of the vehicle or 120 days, which ever comes first. After the cost of storage exceeds the value of the vehicle or 120 days, the vehicles are either auctioned off or sent to salvage.

The City charges a \$75 fee for towing and a \$30 fee for towing administration. Storage fees amount to \$20 per 24-hour period. The fees charged for towing and storage are regulated by the State.

2. THE PUBLIC WORKS DEPARTMENT SHOULD CEASE PROVIDING TOWED VEHICLE STORAGE.

The financials for 2004 for the Towing and Storage Division are presented in the table following this page. The Public Works Department provided the financial data for

2004.

| Month | Revenue | Expenditures | Difference |
|--------------|-----------------------|---------------------|---------------------|
| Jan-04 | \$87,537.00 | \$77,897.12 | \$9,639.88 |
| Feb-04 | \$103,283.00 | \$80,997.02 | \$22,285.98 |
| Mar-04 | \$94,057.00 | \$82,868.16 | \$11,188.84 |
| Apr-04 | \$77,354.20 | \$78,541.50 | \$(1,187.30) |
| May-04 | \$77,528.00 | \$79,264.85 | \$(1,736.85) |
| Jun-04 | \$94,667.90 | \$91,233.90 | \$3,434.00 |
| Jul-04 | \$90,152.09 | \$86,288.97 | \$3,863.12 |
| Aug-04 | \$103,086.46 | \$73,396.88 | \$29,689.58 |
| Sep-04 | \$81,517.03 | \$55,396.00 | \$26,121.03 |
| Oct-04 | \$87,154.75 | \$78,862.72 | \$8,292.03 |
| Nov-04 | \$101,526.00 | \$73,549.48 | \$27,976.52 |
| Dec-04 | \$107,762.58 | \$89,791.39 | \$17,971.19 |
| TOTAL | \$1,105,626.01 | \$948,087.99 | \$157,538.02 |

Important points to note concerning the data in the table are presented below.

- Total revenues generated by the Towing and Storage Division amounted to \$1,105,626. These revenues consist primarily of towing fees and storage fees.
- The average monthly revenue amounted to \$92,135 with a low of \$77,534 in April and a high of \$107,762 in December.
- The total expenditures amounted to \$948,087. These expenditures consist primarily of towing fees by CJ's Towing and personnel service expenses.
- The average monthly expenditures amounted to \$79,007 with a low of \$55,396 in September and a high of \$91,233 in June.
- In two months, the Towing and Storage Division experienced a loss: April and May 2004.
- The average profit margin, based upon the data provided by the Public Works Department amounted to 16.6%.
- In 2004, the revenues exceeded expenditures by \$157,538.
- The reserves available at the end 2004 amounted to \$291,955.

There is, however, a flaw in this data. The personnel service expenditures reflect salary expenses, but not fringe benefit expenses. It also does not reflect departmental or citywide overhead costs for services such as payroll, personnel, law, etc.

The fringe benefit expenses amount to approximately \$100,000 annually assuming a 30% fringe benefit rate. The addition of fringe benefit expenses to the 2004 financial data would have reduced the extent to which revenues exceeded expenditures to a little more than \$57,000.

This margin is less than the City would have received had it not been in the towed vehicle storage business. CJ's Towing is required by contract to pay the City a \$30 administration fee regardless of whether CJ's Towing stores the vehicle or the Public Works Department stores the vehicle. If the Public Works Department had not been in the business of towed vehicle storage in 2004, CJ's Towing would have received and stored an additional 7,059 vehicles. Based on the Public Works Department estimate that 75% of the vehicles being recovered by the owner, the City would have received that \$30 administrative fee for approximately 5,294 vehicles or \$158,820. This exceeds the margin that the Towing and Storage Division generated in 2004 when the costs of fringe benefits are included.

Recommendation: The Public Works Department should cease providing towed vehicle storage, and outsource towing and storage of vehicles.

Recommendation: The Public Works Department should issue a request for proposal for towing and storage services.

3. THE CITY SHOULD CHARGE A FINE OF \$250 FOR ABANDONED VEHICLES.

Massachusetts General Law Chapter 90, Section 22B allows a city or town to fine the owner of an abandoned vehicle \$250 for the first abandonment and \$500 for each abandonment thereafter. The chapter further provides that the conviction of a violation of this section shall be reported to the registrar of motor vehicles who may revoke for a period of three months the driver's license of the person that was convicted

and the person shall be prohibited from registering another motor vehicle for a period of one year.

The City already faces the problem of abandoned vehicles. Owners do not recover an estimated 25% of the vehicles towed to the facility operated by the Towing and Storage Division. This amounts to an estimated 1,500 vehicles a year.

The City of Worcester has already taken the step of levying a fine as part of their abandoned vehicle program. It reported in its fiscal year 2005 budget that, “to date, more than 2,000 vehicles have been tagged, resulting in over 800 vehicles being moved by the owner and over 1,000 being towed. Additionally, this program has proven to be self-sufficient with the revenue from penalties/citations more than offsetting the towing and storage costs.” Currently, the program has tagged 4,089 vehicles and towed 1,792 vehicles. The City uses a private towing company. The City charges the \$250 fine, a \$106 administrative fee (It is \$50, but the fee is being raised to \$106 on July 1, 2005), and a \$50 tow and storage fee. Since the initiation of the program, the City has collected \$135,100, and incurred expenses of \$95,000.

The City should take the steps necessary to enable the City to levy and collect this \$250 fine. The City should require CJ’s Towing to report all vehicles that are not recovered by their owner. The City should levy and collect this fine and retain all of the revenue collected as a result. This will require the City to send a written notice to the owner’s last known address, conduct an informal hearing, and notify the registrar of motor vehicles. If the City was able to recover this fine in one-half to three-quarters of the fines, the City would recover approximately \$190,000 to \$280,000 annually.

Recommendation: The Public Works Department should take the steps necessary to enable the City to levy and collect a \$250 fine for abandoned vehicles.

11. WATER AND SEWER DIVISION

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The Water/Sewer Section replaces water and wastewater mains, clears sewers of infiltration and infestation, televises sewer mains, installs and repair services, replaces and repairs fire hydrants, maintains the City's stormwater drains, etc.

The Water and Sewer Division is authorized 73 staff. This is based upon the Position Control Worksheet for the Fiscal Year 2006 budget and the Vacant DPW Positions Report dated April 12, 2005. This 73 staff are allocated as follows:

- 32 positions are allocated to the Water Section;
- 28 positions are allocated to the Sewer Section:
- 6 positions are on workers compensation or FMLA;
- 3 positions, although budgeted in the Water and Sewer Division, actually work elsewhere including the Stores Section, Engineering (Digsafe), and Administration;
- 1 position is the Deputy Director; and
- 3 positions are vacant.

This staff is responsible for the maintenance and repair of an extensive infrastructure.

1. THE WATER AND SEWER DIVISION SHOULD TAKE A NUMBER OF MEASURES TO IMPROVE THE WORK OUTPUT OF ITS STAFF.

The project team analyzed the allocation of regular (and not overtime) staff hours for the Water and Sewer Division for the week ending March 26, 2005. This analysis excluded staff from divisions other than 922 that were charging their time to the water and sewer job numbers, and also excluded contractors.

The staff assigned to the Water and Sewer Division charged 886 staff hours to sewer job numbers. The allocation of these hours by job number is presented below.

CITY OF SPRINGFIELD, MASSACHUSETTS
Assessment of the Public Works Department

| Work Activity | Job Number | Regular | % of Total |
|------------------------------------|------------|--------------|------------|
| Sewer - Cleaning Mains | 922-693500 | 164.0 | 18.5% |
| Sewer - Complaint Truck | 922-695100 | 57.0 | 6.4% |
| Sewer - General Maintenance | 922-692500 | 20.0 | 2.3% |
| Sewer - Lawn Repair | 922-732100 | 16.0 | 1.8% |
| Sewer Call-No Problem Found | 922-966360 | 2.0 | 0.2% |
| Sewer Connection-Dig Up and Repair | 922-966359 | 3.0 | 0.3% |
| Sewer Incentive | 922-102004 | 8.0 | 0.9% |
| Sewer Inspect Sewer | 922-182000 | 44.0 | 5.0% |
| Sewer Personal | 922-102005 | 40.0 | 4.5% |
| Sewer Sick | 922-102007 | 124.0 | 14.0% |
| Sewer Small Sewer Repair | 922-145000 | 32.0 | 3.6% |
| Sewer Supervision | 922-102002 | 80.0 | 9.0% |
| Sewer Vacation | 922-102006 | 81.0 | 9.1% |
| Sewer-Jet Sewer Connection | 922-966364 | 2.0 | 0.2% |
| Sewer-Meal Ticket | 922-912102 | 20.0 | 2.3% |
| Sewer-Rod Sewer Connection | 922-966357 | 5.0 | 0.6% |
| Sewer-Rod Sewer Connection | 922-966362 | 5.0 | 0.6% |
| Sewer-Rod Sewer Connection | 922-966362 | 5.0 | 0.6% |
| Sewer-Rod Sewer Connection | 922-966363 | 2.0 | 0.2% |
| Sewer-Yard | 922-862000 | 176.0 | 19.9% |
| Sub-Total | | 886.0 | |

Important points to note concerning the data contained in the table are presented below.

- 28.5% of the staff hours were charged to leave including incentive, personal, sick, and vacation;
- 19.9% of the staff hours were charged to the yard;
- 18.5% of the staff hours were charged to cleaning mains;
- 9% of the staff hours were charged to supervision; and
- * 6.4% of the staff hours were charged to sewer-complaint truck.

These five work activities comprise 82.3% of the total hours for this week. Only 24.9% of this 82.3% actually involved work involving the maintenance of the sewer system: cleaning mains and the sewer complaint truck.

The staff assigned to the Water and Sewer Division charged 960 staff hours to sewer job numbers. The allocation of these hours by job number is presented below.

CITY OF SPRINGFIELD, MASSACHUSETTS
Assessment of the Public Works Department

| Work Activity | Job Number | Regular | % of Total |
|---|------------|--------------|------------|
| Water - Check Water Leak | 922-500156 | 24.0 | 2.5% |
| Water - Pavement Management-Springfield | 922-421200 | 24.5 | 2.6% |
| Water Bereavement | 922-101009 | 22.5 | 2.3% |
| Water Hydrant Inspection | 922-422000 | 20.0 | 2.1% |
| Water Hydrant Maintenance | 922-422100 | 48.0 | 5.0% |
| Water Service - New | 922-431767 | 37.5 | 3.9% |
| Water Service - New | 922-431799 | 28.0 | 2.9% |
| Water Service - New | 922-431813 | 15.0 | 1.6% |
| Water Service - New | 922-431828 | 24.0 | 2.5% |
| Water Service - Replacement | 922-431692 | 45.0 | 4.7% |
| Water Service - Replacement | 922-431744 | 15.0 | 1.6% |
| Water Service - Replacement | 922-431745 | 12.0 | 1.2% |
| Water Service - Replacement | 922-431800 | 12.0 | 1.2% |
| Water Service - Replacement | 922-431814 | 29.0 | 3.0% |
| Water Service - Replacement | 922-431827 | 8.0 | 0.8% |
| Water Sick | 922-101007 | 16.0 | 1.7% |
| Water Supervision | 922-101002 | 84.0 | 8.7% |
| Water Vacation | 922-101006 | 95.0 | 9.9% |
| Water-Box - Digup and Replace | 922-431827 | 12.0 | 1.2% |
| Water-Building Maintenance | 922-492000 | 40.0 | 4.2% |
| Water-Dig Up and Replace IK | 922-500158 | 5.0 | 0.5% |
| Water-Hydrant - Frozen | 922-431831 | 32.0 | 3.3% |
| Water-Hydrant Maintenance | 922-500021 | 8.0 | 0.8% |
| Water-Hydrant Repair | 922-500140 | 8.0 | 0.8% |
| Water-Hydrant Replacement | 922-500082 | 32.0 | 3.3% |
| Water-Hydrant Replacement | 922-500091 | 24.0 | 2.5% |
| Water-Hydrant Replacement | 922-500093 | 109.0 | 11.3% |
| Water-Hydrant Replacement | 922-500171 | 32.0 | 3.3% |
| Water-Main Install | 922-500096 | 32.0 | 3.3% |
| Water-Main Repair | 922-500177 | 16.0 | 1.7% |
| Water-Meal Ticket | 922-911102 | 51.0 | 5.3% |
| Sub-Total | | 960.5 | |

Important points to note concerning the data contained in the table are presented below.

- 20.5% of the staff hours were allocated to hydrant replacement;
- 13.9% of the staff hours were allocated to leave including bereavement, sick, and vacation; and
- 23.5% of the staff hours were allocated to installation of new water services and replacement of water services.

These three work activities comprise 57.9% of the total hours for this week.

There are a number of issues apparent with the allocation of the staff hours in the Water and Sewer Division. These issues are presented in the paragraphs below.

(1.1) Improper Crew Sizes Were Being Utilized.

The Water and Sewer Division is not planning and scheduling its work on a bi-weekly basis. Rather, the Division is reacting to emergencies, and failing to define optimum crew sizes. To some degree, this is understandable. The Division is reacting to the work orders issued by the Water and Sewer Commission, and requested work on a reactive basis from the Commission.

However, the crew sizes utilized in a number of cases appear to be larger than appropriate. For example:

- **The crew size utilized for hydrant replacement was four to five-persons.** The benchmark utilized by the project team is a two-person crew for hydrant replacement.
- **The crew size used for water service replacement or installation of a new water service ranged from three-persons to six-persons with a median of five persons.** The benchmark utilized by the project team is a two-person crew for hydrant replacement.
- **The crew size used for hydrant maintenance was three to four-persons.** The benchmark used by the project team is a two-person crew.

These reflect actual crew sizes as reported in the Weekly Time Report for the week ending March 26, 2005.

Recommendation: The Water and Sewer Division should utilize proper crew sizes for its work activities except in exigent circumstances.

(1.2) Unproductive or inappropriate Work Activities Were Performed.

Examples of unproductive or inappropriate work activities include the following:

- The sewer crews allocated 176 hours to the yard;
- The sewer crews cleaned out blockages in private sewer laterals or

connections, although only 22 hours were allocated to this work activity during this week; and

- Although it did not occur during this week, sewer crews will replace private sewer laterals or connections at the homeowners request with reimbursement for these costs being provided by the homeowner.

These activities detract from the ability of the sewer crews to preventively maintain the sewer collection system.

Recommendation: The Water and Sewer Division should not clean out blockages of sewer connections or replace private sewer laterals or connections at the homeowner's request.

2. THIRTY-SIX STAFF SHOULD BE ALLOCATED TO THE WATER AND SEWER DIVISION.

The project team, in analyzing the staffing requirements for the Water and Sewer Division, began with two premises: (1) the Division should focus its efforts and staff on preventive maintenance of the system, and (2) the construction work associated with replacement and extension of mains should be outsourced. The paragraphs that follow present the results of the analysis based upon those premises.

(2.1) Seventeen Staff Are Required for the Preventive Maintenance of the Water Distribution System and the Sewer and Stormwater Collection Systems.

There are a number of guidelines for effective preventive maintenance of the water, sewer and stormwater infrastructure.

The American Water Works Association (AWWA), in its standard G200-4 Distribution Systems Operation and Management, defines a number of requirements.

These include such requirements as the following:

- System flushing – The utility shall develop and implement a systematic flushing program that meets the need of the utility, taking into consideration the condition of the system, hydraulic capacity, treatment, water quality, and other site specific criteria;

- Water loss – The utility shall have an annual goal for the amount of water loss;
- Valve exercising program – the utility shall have a valve-exercising program;
- Fire hydrant maintenance and testing – the utility shall have a hydrant maintenance and fire flow testing program;
- Backflow prevention – The utility shall have a comprehensive cross-connection control and backflow-prevention program;
- Meter testing – To ensure meter accuracy, the utility shall have a goal to test and replace meters at the frequencies recommended in AWWA Manual M6;
- Treated water storage facilities – The utility shall have a maintenance program that includes periodic cleaning and refurbishing of facilities, as required, including an internal inspection at a minimum of every 5 years; and
- The utility shall establish an annual goal in terms of water main breaks per 100 miles of water mains per year.

The project team used a number of other benchmarks for preventive maintenance of the wastewater and stormwater collection systems. Some of these benchmarks derive from sources such as CMOM (Capacity, Management, Operations, and Maintenance), a set of standards developed by the EPA for wastewater collection systems, data developed by the Water Environmental Research Foundation, and the experience of the project team. These benchmarks are presented below.

- Data generated by the Water Environmental Research Foundation indicates that sewer utilities are inspecting an average of 7% of their sewer mains annually using sewer television units.
- Data generated by the water Environmental Research Foundation indicates that sewer utilities are cleaning an average of 20.5% of their sewer mains annually.
- Data generated by the Water Environmental Research Foundation indicates that sewer utilities are inspecting an average of 19.2% of their manholes annually.
- A grease trap program is in place for restaurants to assure restaurants are maintaining their grease traps and using these grease traps.
- Catch basins should be cleaned and inspected on an annual basis.

- 1% to 2% of water and sewer mains are replaced annually through a formal water and wastewater main rehabilitation and replacement program.
- The project team uses a metric that air release valves are checked on a bi-annual basis, and valves are preventively maintained and rebuilt if necessary.

The Water and Sewer Division does not meet these requirements. The Division is not preventively maintaining the water distribution system. The table below presents the work output for the Division for the water distribution system for the past three years.

| Work Output | 2002 | 2003 | 2004 |
|-------------------------------------|-------------|-------------|-------------|
| Services replaced a/c leak | 107.0 | 60.0 | 37.0 |
| Services replaced a/c pressure | 51.0 | 94.0 | 181.0 |
| Services replaced letter pavement | - | 3.0 | 3.0 |
| Services repaired, norm maint. | 83.0 | 85.0 | 75.0 |
| Services repaired, hit by cont/util | 12.0 | 17.0 | 17.0 |
| New Services | 112.0 | 197.0 | 111.0 |
| New Services-stubs to treebelt | 9.0 | 21.0 | 26.0 |
| New services a/c paving | - | 1.0 | - |
| Services tap on Main | | | 151.0 |
| Ser-Mains/relocated/raise/moved | 5.0 | 5.0 | 3.0 |
| Services-Main-Gates-cut-off | 35.0 | 37.0 | 27.0 |
| Main breaks | 36.0 | 53.0 | 28.0 |
| New Hydrants & set a/c new main | 13.0 | 25.0 | 27.0 |
| Hydrants repaired* | 76.0 | 76.0 | 98.0 |
| Hydrants replaced | 89.0 | 76.0 | 79.0 |
| Hydrants removed/relocated | 11.0 | 5.0 | 10.0 |
| Hydrants moved/raised | 1.0 | 4.0 | 8.0 |
| New/extended main installations # | 6,119.5 | 6,901.5 | 11,085.4 |

As the table indicates, the Water and Sewer Division dedicates its staff to water distribution system construction and repair including replacing services, installing new services, repairing and replacing fire hydrants, installing new or extending water mains, etc. There isn't any workload for preventive maintenance of the water distribution system.

As a consequence, the Water and Sewer Commission has begun to staff up and

assume these responsibilities. At present, the Commission has assumed responsibility for the backflow prevention program, a meter testing program, and treated water storage facilities. The Commission has also indicated that it will begin to staff up to assume responsibility valve exercising.

The problem with effective preventive maintenance of the infrastructure is not limited to the water distribution system. This problem is also present with the sewer collection system and the stormwater collection system although the Division does allocate staff resources to preventive maintenance. The work output for the sewer collection system and the stormwater collection system is presented in the table below.

| Work Output | 2002 | 2003 | 2004 |
|------------------------------------|-------------|-------------|-------------|
| C/B Cleaning (lbs) 293/299/561/562 | 1,842,697.0 | 436,057.0 | 587,188.0 |
| C/B Cleaning (no.) 293/299/561/562 | 1,381.0 | 425.0 | 462.0 |
| Jetting Mains (ft.) 561/562/288 | 900,126.0 | 224,505.0 | 492,803.0 |
| Rodding Jobs | 377.0 | 369.0 | 369.0 |
| Standing Mains (Cleared) | 146.0 | 142.0 | 125.0 |
| Syphons Checked (23) No. of Times | 232.0 | 194.0 | 224.0 |
| Syphons Blocked & Cleared | 92.0 | 65.0 | 45.0 |
| C/B Rebuilt/Repaired | 225.0 | 111.0 | 98.0 |
| Storm Repairs | 65.0 | 52.0 | 35.0 |
| Sanitary Repairs (H.C.) | 106.0 | 74.0 | 53.0 |
| Sanitary Repairs (Mains) | 77.0 | 59.0 | 40.0 |
| Cave-ins Repaired | 49.0 | 49.0 | 38.0 |

Important points to note regarding the work output of the Water and Sewer Division as it pertains to the sewer collection system and the stormwater collection system are presented below.

- None of the sewer mains were televised at all during this 3-year period.
- 93.3 miles of sewer mains were cleaned in 2004 or 15.5% of the total.
- No sewer manholes were inspected.
- The Division does not have a grease trap program.

- 462 catch basins were cleaned in 2004 of an estimated 4,500. (The Water and Sewer Division provided an estimate of 6,500; the project team believes this estimate is higher than actual). This is equivalent to a 10-year schedule.
- The Division does not identify the linear feet of sewer mains replaced within its quarterly report. Over the last three years, the Division has replaced approximately 4.56 miles of water mains or approximately 0.3% annually.
- The Water and Sewer Division does not check air release valves.

The Water and Sewer Division does not meet any of these metrics for preventive maintenance of the water, sewer, and stormwater infrastructure.

To establish a preventive maintenance program, the project team applied performance standards to the water, sewer, and stormwater infrastructure in the City to determine the minimum staffing needs for such a program. These staffing requirements are provided in the exhibit following this page. This exhibit does not include a factor for leave and a vacancy factor. Based upon the leave taken by employees of the water and Sewer Division in 2003-04 and a 9% leave factor, approximately 1.38 positions would be required for each position identified within the annual work program.

The Water and Sewer Division should allocate 17 employees to preventive maintenance of the water, sewer, and stormwater infrastructure. The following crew compositions are recommended:

- A 2-person crew should be allocated to valve exercising. A second 2-person crew will need to be dedicated to this work activity approximately 44% of the year.
- A 1-person crew will need to be dedicated to fire hydrant maintenance. A second 1-person crew will need to be allocated to this work activity approximately 80% of the year.
- A 1-person crew will need to be dedicated to inspection and maintenance and repair of air relief valves.

Annual Work Program for the Preventive Maintenance of the Water Distribution, Sewer Collection, and Stormwater Collection Systems

| Activity Name | Inventory Measure | Units | Per Inventory | Unit | AWQ | ADP | Crew Days | Crew Size | Staff Days |
|--------------------------------|-------------------|--------|---------------|-------|---------|------|-----------|-----------|------------|
| Valve Exercising | Units | 16,000 | Units | 0.50 | 8,000.0 | 27.5 | 290.9 | 2 | 581.8 |
| Fire Hydrant Maintenance | Units | 5,800 | Units | 1.00 | 5,800.0 | 16.0 | 362.5 | 1 | 362.5 |
| Air Release Valve Maintenance | Units | 840 | Units | 0.50 | 420.0 | 2.1 | 200.0 | 1 | 200.0 |
| Sewer Main Cleaning | Miles | 600 | Miles | 0.20 | 120.0 | 0.8 | 157.9 | 2 | 315.8 |
| Catch Basin Cleaning | Units | 4,500 | Units | 1.00 | 4,500.0 | 20.0 | 225.0 | 2 | 450.0 |
| CCTV Inspection of Sewer Mains | Miles | 600 | Miles | 0.07 | 42.0 | 0.2 | 221.8 | 3 | 665.3 |
| Syphon Cleaning | Syphons | 23 | Syphons | 12.00 | 276.0 | 5.0 | 55.2 | 2 | 110.4 |
| Equipment and Shop Maintenance | Labor Hours | 1 | Labor Hours | 1.00 | 202.0 | 1.0 | 328.0 | 1 | 353.0 |
| | | | | | | | | | 3,038.8 |

- A 2-person crew will need to be dedicated to sewer main cleaning for approximately 80% of the year.
- A 2-person crew will need to be dedicated to catch basin cleaning. A second crew would need to be allocated to this work activity approximately 10% of the year.
- A 3-person crew will need to be dedicated to CCTV inspection of sewer mains. A second crew would need to be allocated to this activity approximately 10% of the year.

In considering this level of staffing, it should be recognized that the Water and Sewer Commission has assumed the responsibility for preventive maintenance of meters, backflow prevention devices, and storage tanks.

Recommendation: The Water and Sewer Division should develop and install a preventive maintenance program for the water, sewer, and stormwater infrastructure.

Recommendation: The Water and Sewer Division should allocate seventeen staff to the preventive maintenance of the water distribution system and the sewer and stormwater collection systems.

Recommendation: The Public Works Department should immediately acquire a jet vactor to clean the stormwater system.

(2.2) Eleven Staff Should Be Allocated To Water Distribution Maintenance and Repair

The exhibit following this page presents the maintenance and repair workload for the water distribution system. Important points to note are presented below.

- **Water services.** 931 crew days, or the equivalent of one and one-half crews – would be required for water service replacement, installation of new water services, water taps, etc. The crew size utilized for this work activity would be 3-persons, which is less than the five-person crew that is currently utilized. An additional 709 person-days would be required for this work activity if a 5-person crew size was utilized, which is the current practice.
- **Fire Hydrants.** 244 crew days, or the equivalent of one-half of a crew – would be required for fire hydrant maintenance and repair. This includes new fire hydrants, repair of fire hydrants, replacement of fire hydrants, etc.

Annual Work Program for Water Distribution Maintenance and Repair

| | Units | AWQ | ADP | Annual Crew Days | Crew Size | Annual Staff Days |
|-------------------------------------|-------------|-----|-----|------------------|-----------|-------------------|
| Water services - replaced | Service | 194 | 1.8 | 107.8 | 3 | 323.3 |
| Water services - new | Service | 137 | 1.2 | 114.2 | 3 | 342.5 |
| Water taps | Taps | 141 | 3.0 | 47.0 | 3 | 141.0 |
| Water services - repaired | Service | 92 | 2.8 | 32.9 | 3 | 98.6 |
| Water service - cutoff | Service | 27 | 4.0 | 6.8 | 3 | 20.3 |
| Water service - relocate/raise/move | Service | 3 | 1.8 | 1.7 | 3 | 5.0 |
| Water main repair | Main breaks | 28 | 1.5 | 18.7 | 3 | 56.0 |
| Fire -hydrant - new | Hydrants | 27 | 1.0 | 27.0 | 2 | 54.0 |
| Fire hydrant - repair | Hydrants | 98 | 4.0 | 24.5 | 2 | 49.0 |
| Fire hydrant - replacement | Hydrant | 79 | 1.2 | 65.8 | 2 | 131.7 |
| Fire hydrant - move/relocate/raise | Hydrant | 18 | 4.0 | 4.5 | 2 | 9.0 |
| Valve - repair/replace | Valve | 300 | 1.6 | 187.5 | 3 | 562.5 |
| Air release valve repair | Valve | 30 | 3.0 | 10.0 | 1 | 10.0 |
| Equipment and Shop Maintenance | Employees | 9 | 1.0 | 202.0 | 1 | 227.0 |
| | | | | 850.2 | | 2,029.8 |

- **Valve repair and replacement.** The Division rarely performs this work activity. The Commission has expended a significant amount of funds over the past several years replacing valves as a result of a lack of preventive maintenance. When the division begins exercising valves, it is inevitable that many valves will need to be repaired or replaced due to the lack of a valve-exercising program. This work activity would require a crew of 3 - persons practically year-round.

Overall, the Water and Sewer Division would require eleven staff for the maintenance and repair of the water distribution system.

Recommendation: Eleven positions should be allocated to water distribution system maintenance and repair.

(2.3) Three Staff Should Be Allocated To The Maintenance and Repair of the Sewer and Stormwater Collection System.

The exhibit following this page presents the maintenance and repair workload for the sewer and stormwater collection system. In essence, a single crew consisting of three persons would be allocated to the maintenance and repair of the sanitary sewer and stormwater collection system including cleaning obstructions in sewer mains, repairing sewer and stormwater mains, and cleaning obstructions in syphons.

Recommendation: Three staff should be allocated to sewer and stormwater collection system maintenance and repair.

(2.4) Five Staff Should Be Allocated to Water and Sewer Administration.

In addition to these staff, the Division would require three Streets and Engineering Foremen, a Secretary, and a Utility Manager. These staff would be required for supervision, management, and clerical support.

Recommendation: Three Streets and Engineering Foremen, a Secretary, and a Utility Manager should be allocated to Water and Sewer Administration.

**Annual Work Program for Sewer and Stormwater Collection
System Maintenance and Repair**

| Work Activity | Units | AWQ | ADP | Annual Crew Days | Crew Size | Annual Staff Days |
|----------------------------------|--------------|------------|------------|-------------------------|------------------|--------------------------|
| Clean obstructions in sewer main | Obstructions | 125 | 4.0 | 31.3 | 2 | 62.5 |
| Sewer main repair | Main breaks | 78 | 1.5 | 52.0 | 3 | 156.0 |
| Stormwater main repair | Main breaks | 35 | 1.5 | 23.3 | 3 | 70.0 |
| Clean obstructions in syphons | Obstructions | 45 | 4.0 | 11.3 | 2 | 22.5 |
| Equipment and Shop Maintenance | Employees | 3 | 1.0 | 202.0 | 1 | 76.0 |
| | | | | | | 387.0 |

(2.5) Twenty-Seven Positions Within the Water and Sewer Division Should Be Eliminated.

Overall, the proposed staffing for the Water and Sewer Division amounts to thirty-six positions for the Water and Sewer Division or twenty-four fewer positions than the sixty positions currently filled (excluding the six positions on worker's compensation or FMLA, the three positions assigned outside the Division although budgeted in the Division, and the Deputy Director).

Recommendation: The level of staffing for the Water and Sewer Division should be reduced by twenty-seven positions.

3. THE WATER AND SEWER DIVISION SHOULD OUTSOURCE MAIN INSTALLATION AND REPLACEMENT.

In 2004, the water and Sewer Division replaced 11,085 linear feet of water mains and 3,195 linear feet of sewer mains. The two sections in the Division, in their plans of organization, allocate a significant number of staff to construction. The Water Section has two main crews: one is allocated six staff including a foreman, while the other is allocated five staff including a foreman. The Sewer Section allocates six staff to construction and another four staff to dig-ups (sewer connections, sewer main repair, stormwater main repair, catch basin repair, etc.

This amounts to twenty-one staff. While the Division should continue to repair mains, it should outsource the replacement and extension of mains.

Recommendation: The Water and Sewer Division should outsource the replacement and extension of water, sewer, and stormwater mains.

4. THE CITY SHOULD RENEGOTIATE ITS AGREEMENT WITH THE WATER AND SEWER COMMISSION.

The City of Springfield and the Water and Sewer Commission have entered into an agreement in which the Public Works Department maintains the wastewater

collection system and the water distribution system owned by the Commission. This is a 10-year agreement that expires on June 30, 2010. The contract specifically states that fringe benefits and indirect city costs are excluded from this contract.

This is a significant and a costly exclusion. The proposed 2005 regular salaries that would be incurred by the Public Works Department for the provision of services to the Water and Sewer Commission are presented below.

- Regular salaries: \$2,153,170;
- Engineering salaries: \$270,000; and
- Regular salaries associated with capital improvement projects: \$300,000.

The City is not recovering reimbursement for fringe benefits for \$2,723,170 in salaries. In addition, the City is not recovering the costs associated with six employees on worker's compensation or FMLA that are assigned to the Water and Sewer Division. The City would recover an estimated \$850,000 in fringe benefit costs if the contract with the Water and Sewer Commission did not exclude that recovery.

In addition, the contract unclearly defines the roles and responsibilities of the Water and Sewer Division. It does not define the specific work activities that will be performed by the Division and not the Water and Sewer Commission. It states that the Division shall perform the following work:

- Wastewater – Operation and maintenance of the wastewater collection system within the geographical boundaries of the City of Springfield; said system includes, but is not necessarily limited to, sanitary and combined sewer piping appurtenances and outfalls, and services as specifically designated.
- Water - Operation and maintenance of the drinking and fire protection water distribution system within the geographical boundaries of the City of Springfield and the Town of Ludlow; said system includes, but is not necessarily limited to, distribution piping, valves, hydrants, services as specifically designated and other appurtenances.

This does not define the specific work activities to be performed by the Division versus the Commission. The result has been that the Commission is gradually filling the void left by the Division in preventive maintenance.

Recommendation: The City should renegotiate the contract with the water and Sewer Commission to recover fringe benefit, indirect, and worker's compensation costs for staff in the Public Works Department allocated to the maintenance and repair of the water and wastewater infrastructure.

Recommendation: The City should negotiate the specific tasks to be performed by the Water and Sewer Division on behalf of the Water and Sewer Commission.